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ABSTRACT

This document contains the Florida program course standards for 151 courses in industrial education. For each course, the following information is provided: program title, effective date of standards, code number, whether secondary or postsecondary, credits, educational level, certification coverage, major concepts/content, laboratory activities, special notes, and intended outcomes. Intended outcomes are further subdivided by subobjectives that outline what students who complete a program must know and/or be able to do. The standards cover the total spectrum of industrial courses, from aeronautical technology and air conditioning to theater technology and welding. (KC)

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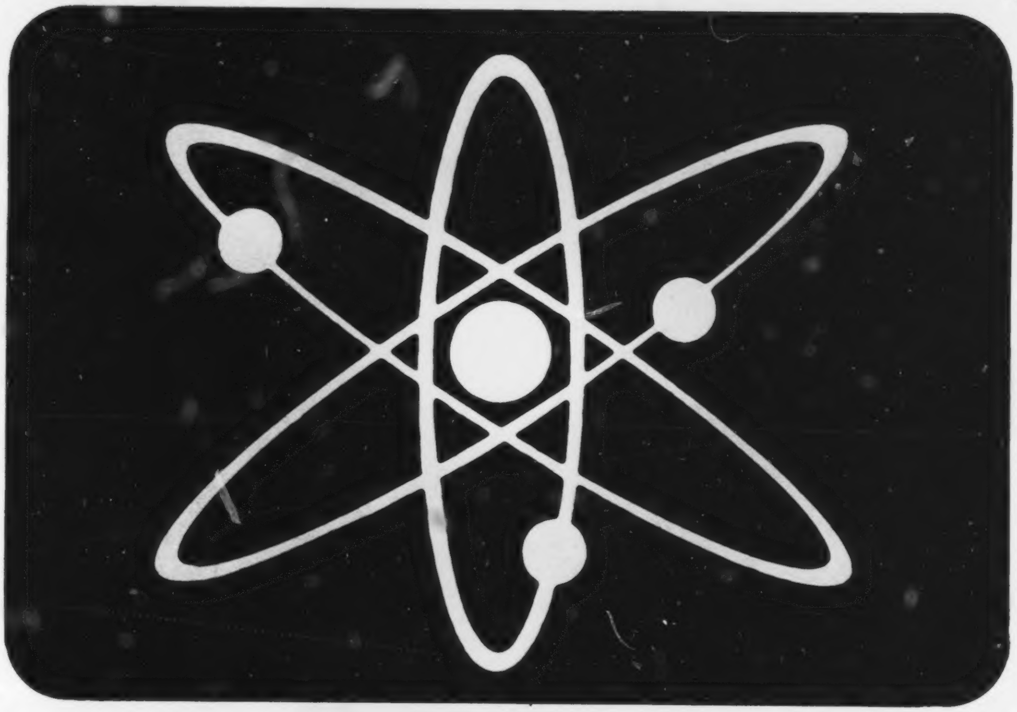
VOCATIONAL EDUCATION PROGRAM COURSES STANDARDS

July, 1987

Industrial Education

ED289035



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VOCATIONAL EDUCATION

PROGRAM COURSES STANDARDS

INDUSTRIAL EDUCATION

July, 1987

FLORIDA DEPARTMENT OF EDUCATION
Division of Vocational, Adult, and Community Education
Bureau of Vocational Program and Staff Development
Program and Staff Development Section
Tallahassee, Florida 32399

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INTRODUCTION

INDUSTRIAL EDUCATION

Industrial Education is comprised of instructional courses, programs, services, and activities at all educational levels for selected trade and industrial occupations.

Industrial Education is a component of vocational education which prepares persons for initial employment and offers opportunities for upgrading or retraining of workers in a wide range of occupational areas. Individuals completing Industrial programs are qualified to function as skilled, semiskilled or technical workers in activities including layout, design, production, repairing products and commodities or rendering personal services. Industrial programs include classroom instruction in: technical-related theory, safety, mathematics and science, laboratory and shop tasks requiring manipulative skills, and cooperative education to provide on-the-job experiences. Instruction is provided for apprentices in apprenticeship occupations or for journeymen already employed in industrial occupations.

A recommended sequence of study covering extensive knowledge in a field of specialization is required for completion of a industrial education program that prepares persons to work in direct support of professional trades persons, engineers or technicians.

Vocational Industrial Clubs of America (VICA) provides additional opportunities to develop leadership, civic responsibilities, free enterprise system concepts and an understanding of the world of work in industrial occupations. Such organized activities, under appropriate supervision, are considered an integral part of the overall instructional program.

Reinforcement of basic skills in English, mathematics, and science appropriate for the job preparatory program is provided through vocational classroom instruction and applied laboratory procedures or practices.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Aeronautical Technology

CODE NUMBER: Secondary ______ Postsecondary ASC0001

Florida CIP IN15.080100

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-15

CERTIFICATION COVERAGE: TEC AERO 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment with occupational titles as research mechanics (002.280-010), flight test data transcribers (002.281-010), test technicians (019.161-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and skills to assist aeronautical engineers in collecting research data relevant to the operation of aircraft and the design, testing, and development of propulsion, control and guidance systems of aircraft and aerospace vehicles.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in applied strength of materials, thermodynamics, and electrical/electronic theory. Strong emphasis is placed on instrumentation and guidance and propulsion systems testing and modification.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1600 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate understanding of fundamentals of aeronautics.
02. Demonstrate understanding of aircraft structure and design.
03. Demonstrate knowledge of aircraft communication equipment.
04. Demonstrate knowledge of aircraft electronic navigation equipment.
05. Demonstrate knowledge of aircraft test equipment and recorders.
06. Read and interpret Federal Aviation Administration manufacturing regulations.

07. Prepare, analyze and evaluate technical reports and data.
08. Develop an understanding of manufacturing processes and materials.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS　　EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education　　SECONDARY NUMBER: ________

PROGRAM TITLE: Aeronautical Technology　　POSTSECONDARY NUMBER: ASC0001

01.0 DEMONSTRATE AN UNDERSTANDING OF FUNDAMENTALS OF AERONAUTICS--The student will be able to:

01.01 Differentiate between aeronautics and aerodynamics.
01.02 State and give examples of Newton's three laws of motion.
01.03 Name and compare the four forces of flight.
01.04 Describe an airfoil.
01.05 Tell how lift is produced.
01.06 Discuss how and why an airplace stalls.
01.07 Describe and explain how pilot, vacuum, pressure and engine instruments work.
01.08 Explain the magnetic compass.
01.09 Apply the methods of analyzing the fundamentals laws relating to the operation of aircraft engines, both reciprocating and jet.
01.10 Apply the fundamental laws of aerodynamic forces, moments, thermodynamics and stresses to the performance of engines, and aircraft.
01.11 Discuss the development of aircraft engines and structures and their problems in flight.
01.12 Describe and apply the Bernoulli's theory to the many aspects of aircraft flight and operation of aircraft parts.

02.0 DEMONSTRATE UNDERSTANDING OF AIRCRAFT STRUCTURE AND DESIGN--The student will be able to:

02.01 Describe the construction and operation of the methods of propulsion by propeller, and jet.
02.02 Explain the conditions and effects of subsonic, trans-sonic, supersonic and hypersonic flow of gases.
02.03 Describe the aircraft units and control surfaces, their purpose, and operation, including fuselage, tail surfaces, and wing surfaces.
02.04 State control devices and the methods necessary to operation the aircraft control surfaces.
02.05 Discuss the tension and compression exerted on structural parts in flight.

03.0 DEMONSTRATE KNOWLEDGE OF AIRCRAFT COMMUNICATION EQUIPMENT--The student will be able to:

03.01 Use and explain function of VHF radios.
03.02 Use and explain function of UHF radios.
03.03 Explain function and frequencies of ELT's.
03.04 Use proper phraseology in using radios.
03.05 Discuss uses and limitations of portable transceivers.
03.06 Explain the principle of basic radio wave theory and its application to radio aids to flight and navigation.
03.07 Explain the concepts and underlying principles of ultra high frequency, LORAN, Microwave, Doppler effect, OMEGA, directional and non-directional antenna.

04.0 DEMONSTRATE KNOWLEDGE OF AIRCRAFT ELECTRONIC NAVIGATION EQUIPMENT--The student will be able to:

04.01 Define radio navigation.
04.02 Explain the magnetic compass.
04.03 Explain VOR navigation.
04.04 Explain the ADF.
04.05 Explain DME and RNAV principles.
04.06 Demonstrate usage of magnetic coordinates.
04.07 Demonstrate and explain the flight computer.
04.08 Explain sectional charts and their use.
04.09 Explain enroute and terminal charts.
04.10 Explain lost communications emergency procedures VFR and IFR.
04.11 Read and interpret aircraft performance charts.
04.12 Plot and explain a cross country course.
04.13 Define and explain wing tip bearing, Isosceles triangle method, intercepts, Homing.
04.14 Explain Loran principles and operational usage.

05.0 DEMONSTRATE KNOWLEDGE OF AIRCRAFT TEST EQUIPMENT AND RECORDERS--The student will be able to:

05.01 Describe the difference between the various destructive and non-destructive testing methods.
05.02 State the tolerance of acceptable errors in testing machines used for testing specimens for different uses and functions.
05.03 Explain the various methods of testing and related equipment such as by acoustic-signature analysis, compression, electrified particles, gamma rays, infrared methods, magnetic particles, microwave method, by penetrants, by radiation, radiographic, ultrasonic, by x-rays.

06.0 READ AND INTERPRET FEDERAL AVIATION ADMINISTRATION MANUFACTURING REGULATIONS--The student will be able to:

06.01 Explain the portion of the Federal Aviation Act of 1958 as amended, which is generally described as Title VI, Safety Regulations of Civil Aeronautics.
06.02 Explain Section 603 of FAA 1958 relation to aircraft certificates.
06.03 Discuss the Federal Aviation Regulations (FAR's) related to Section 603 of FAA 1958.
06.04 Compare, and describe type certificates, production certificates, and air worthiness certificates.
06.05 Explain Section 603 (a) (2), Section 603 (b), and 603 (c) relating to type, production, and airworthiness certificates.
06.06 State and compare FAR's 21, 23, 25, 27, 29, 31, 33 and 35.

07.0 PREPARE, ANALYZE AND EVALUATE TECHNICAL REPORTS AND DATA--The student will be able to:

07.01 State the five basic guidelines for preparation of technical reports.
07.02 Compare the difference between technical and literary description.
07.03 Describe the techniques used in technical report writing.
07.04 Discuss the arrangement of the technical written report--such as cause and effect, inductive and deductive, enumeration and classification, problems and solution.
07.05 Explain the preparatory work or stages in the process such as the writing, the drafts, use of the library, and polish style.
07.06 Tell types of reports, and describe use of illustrations.
07.07 Discuss the steps in developing an oral presentation.

08.0 DEVELOP AN UNDERSTANDING OF MANUFACTURING PROCESSES AND MATERIALS--The student will be able to:

08.01 Describe the portion of the Federal Aviation Act of 1958 as amended, which is generally described as Title VI, Safety Regulations of Civil Aeronautics.
08.02 State the Federal Aviation Regulations (FAR's) related to the manufacturing aspect of Section 603 of Title VI, of the Federal Aviation Act of 1958.
08.03 Compare the governing FAR's with the existing state of the art in manufacturing processes and materials for compliance.
08.04 Define and compare the various manufacturing processes, including casting methods, powder metallurgy, forging processes, extrusion processes, metal stamping and forming, machine processes, automatic machines and numerical control, welding processes, assembly method, and protective coatings.
08.05 Describe the various materials--their characteristics and applications, including iron and steel, alloy steels, non-ferrous metals (aluminum, magnesium, copper, zinc, nickel, and alloys) plastics, and ceramics.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.

09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Air Conditioning, Refrigeration, and Heating Mechanics

CODE NUMBER: Secondary ______ Postsecondary ACR0080

Florida CIP IN47.020100

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-17

CERTIFICATION COVERAGE: AC HEAT ME 7 REFRG MECH @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as air conditioning, heating and refrigeration mechanics (50080200), air conditioning mechanics (620.281-010), air conditioning and heat installer-servicers (637.261-014), air conditioning and heating mechanics (637.261-014), air conditioning and heating helpers (637.664-010), refrigeration mechanics (827.361-014), refrigeration mechanic helpers (637.261-026), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills; leadership skills; human relations and employability skills; safe and efficient work practices; planning, installation, testing and servicing of air conditioning, refrigeration and heating systems and components; servicing, installation and troubleshooting electrical and mechanical components; testing, diagraming and solving problems in air conditioning, refrigeration and heating equipment; recordkeeping; basic supervisory skills; use and care of hand tools, power tools, specialized tools and equipment; and use of current industry standards, practices and techniques.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in brazing and soldering tubing and piping, installing and servicing controls and components, electrical wiring, troubleshooting of electrical and mechanical systems, routine maintenance and service, use specialized tools and equipment, job estimating and code compliance.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 2160 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of orientation practices.
02. Apply basic air conditioning and refrigeration skills.

03. Apply tubing piping, soldering and brazing skills.
04. Apply basic refrigeration fundamentals skills.
05. Apply basic electrical skills.
06. Install and service air conditioning and refrigeration electrical systems.
07. Install, maintain and repair residential air conditioning systems.
08. Install, maintain and repair commercial air conditioning systems.
09. Install, maintain and repair commercial refrigeration systems.
10. Install, maintain and repair heating systems.
11. Apply basic heat gain, heat loss and design skills.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARD
EFFECTOVE DATE: July, 1987

PROGRAM AREA: Industrial Education
SECONDARY NUMBER: ____________

PROGRAM TITLE: Air Conditioning, Refrigeration, and Heating Mechanics
POST SECONDARY NUMBER: ACR0080

01.0 DEMONSTRATE KNOWLEDGE OF ORIENTATION PRACTICES--The student will be able to:

01.01 Demonstrate understanding of school and shop policies.
01.02 Complete course administrative forms and activities.

02.0 APPLY BASIC AIR CONDITIONING AND REFRIGERATION SKILLS--The student will be able to:

02.01 Apply safety practices.
02.02 Apply basic mathematics skills.
02.03 Apply recordkeeping skills.
02.04 Identify and use hand and power tools.
02.05 Identify and use specialized tools.

03.0 APPLY TUBING, PIPING, SOLDERING AND BRAZING SKILLS--The student will be able to:

03.01 Install and service tubing and fittings.
03.02 Install and service pipe and fittings.
03.03 Use soft soldering practices.
03.04 Use brazing practices.

04.0 APPLY BASIC REFRIGERATION FUNDAMENTALS SKILLS--The student will be able to:

04.01 Apply basic refrigeration safety practices.
04.02 Identify basic refrigeration cycle.
04.03 Compare refrigerant pressure to temperature relationships.
04.04 Identify and service refrigeration system and components.
04.05 Apply dehydration and evacuation procedures.
04.06 Service and charge a basic refrigeration system.
04.07 Locate and repair refrigeration system leaks.
04.08 Test, analyze and replace compressors.
04.09 Apply troubleshooting techniques for refrigeration systems.

05.0 APPLY BASIC ELECTRICAL SKILLS--The student will be able to:

05.01 Apply basic electrical safety practices.
05.02 Identify the nature of electricity.
05.03 Identify magnetism and electromagnetism induction.
05.04 Identify electrical componenets symbols and diagrams.
05.05 Apply basic electrical theory and calculations.
05.06 Calculate and measure electrical valves in series and parallel circuits.
05.07 Compare alternating to direct current.
05.08 Test electrical components.
05.09 Test single and three phase motors.
05.10 Test capacitors.
05.11 Test solid state components.
05.12 Troubleshoot/diagnose electrical circuits.
05.13 Read schematics and diagrams.

06.0 INSTALL AND SERVICE AIR CONDITIONING AND REFRIGERATION ELECTRICAL SYSTEMS--The student will be able to:

06.01 Install and service electrical components.
06.02 Install and service electrical controls.
06.03 Troubleshoot/diagnose electrical components and controls.
06.04 Test, analyze, remove and replace single phase motors.
06.05 Test, analyze, remove and replace three phase motors.
06.06 Test, analyze, remove and replace thermostatic controls.

07.0 INSTALL, MAINTAIN AND REPAIR RESIDENTIAL AIR CONDITIONING SYSTEMS--The student will be able to:

07.01 Install, test, analyze and repair air to air systems.
07.02 Install, test, analyze and repair water to air systems.
07.03 Install, test, analyze and repair heat pump systems.
07.04 Test and analyze air movement systems.
07.05 Apply local and national codes.

08.0 INSTALL, MAINTAIN AND REPAIR COMMERCIAL AIR CONDITIONING SYSTEMS--The student will be able to:

08.01 Install, test, analyze and repair air to air systems.
08.02 Install, test, analyze and repair water to air systems.
08.03 Install, test, analyze and repair heat pump systems.
08.04 Install, test, analyze and repair chiller systems.
08.05 Test and analyze air movement systems.
08.06 Apply local and national codes.
08.07 Install, service and repair cooling towers.
08.08 Install, service and repair water cooled condensers.
08.09 Install, service and repair water treatment systems.
08.10 Apply accepted industry pipe sizing and installation procedures.

09.0 INSTALL, MAINTAIN AND REPAIR COMMERCIAL REFRIGERATION SYSTEMS--The student will be able to:

09.01 Install, test and analyze and adjust refrigerant pressure regulating devices.
09.02 Test, analyze and replace electrical controls and components.
09.03 Test, analyze and replace defost systems.
09.04 Test, analyze and replace pump down systems.
09.05 Use various refrigeration equipment electrical diagrams.
09.06 Apply industry accepted piping installation procedures.
09.07 Apply industry pipe sizing standards.
09.08 Install, service and repair ice machines and speciality systems.
09.09 Apply local and national codes.

10.0 INSTALL, MAINTAIN AND REPAIR HEATING SYSTEMS--The student will be able to:

10.01 Install, service and repair a gas furnace.
10.02 Install, service and repair an oil furnace.
10.03 Install, service and repair electric furnace.
10.04 Install, service and repair duct heaters.
10.05 Install, service and repair auxiliary heat strips.
10.06 Install, service and repair solar heating systems.
10.07 Install, service and repair miscellaneous heating equipment.
10.08 Apply local and national codes.
10.09 Install, service and repair hydronic systems.
10.10 Test and analyze heating air movement systems.

11.0 APPLY BASIC HEAT GAIN, HEAT LOSS AND DESIGN SKILLS--The student will be able to:

11.01 Calculate heating and cooling requirements.
11.02 Calculate and design air distribution systems.
11.03 Determine air properties by use of psychrometerics.
11.04 Calculate cooling and heating equipment sizes.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Air Conditioning, Refrigeration and Heating Technology

CODE NUMBER: Secondary _______ Postsecondary ACR0090

Florida CIP IN15.050100

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-15

CERTIFICATION COVERAGE: TECH MECH @ 7 AC HEAT ME 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as air conditioning, heating and refrigeration mechanics (60080200), air conditioning and heating technicians (007.181-010) heat transfer technicians (007.181-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, and safe and efficient work practices. The program prepares students to assist in engineering departments or work independently, capable of designing, installing, maintaining and operating small or medium air conditioning, heating or refrigerating systems.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in design and fabrication of piping, design, install and service controls and components, electrical wiring diagrams, troubleshoot electrical and mechanical systems, job estimating and code compliance.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 8.0 . This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 2400 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of orientation procedures.
02. Apply basic air conditioning and refrigeration skills.
03. Apply tubing piping, soldering and brazing skills.
04. Apply basic refrigeration fundamentals skills.
05. Apply basic electrical skills.
06. Install and service air conditioning and refrigeration electrical systems.
07. Install, maintain and repair residential air conditioning systems.
08. Install, maintain and repair commercial air conditioning systems.

09. Install, maintain and repair commercial refrigeration systems.
10. Install, maintain and repair heating systems.
11. Apply basic heat gain, heat loss and design skills.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARD
EFFECTIVE DATE July, 1987

PROGRAM AREA: Industrial Education
SECONDARY NUMBER: ____________

PROGRAM TITLE: Air Conditioning, Refrigeration and Heating Technology
POSTSECONDARY NUMBER: ACR0090

01.0 DEMONSTRATE KNOWLEDGE OF ORIENTATION PRACTICES--The student will be able to:

01.01 Demonstrate understanding of school and shop policies.
01.02 Complete course administrative forms and activities.

02.0 APPLY BASIC AIR CONDITIONING AND REFRIGERATION SKILLS--The student will be able to:

02.01 Apply safety practices.
02.02 Apply basic mathematics skills.
02.03 Apply recordkeeping skills.
02.04 Install and service tubing and fittings.
02.05 Install and service pipe and fittings.
02.06 Identify and use hand and power tools.
02.07 Identify and use specialized tools.
02.08 Write job specifications.
02.09 Read blueprints and mechanical drawings.
02.10 Prepare, analyze, and evaluate technical reports and data.

03.0 APPLY TUBING, PIPING, SOLDERING AND BRAZING SKILLS--The student will be able to:

03.01 Install and service tubing and fittings.
03.02 Install and service pipe and fittings.
03.03 Use soft soldering practices.
03.04 Use brazing practices.

04.0 APPLY BASIC REFRIGERATION FUNDAMENTALS SKILLS--The student will be able to:

04.01 Apply basic refrigeration safety practices.
04.02 Identify basic refrigeration cycle.
04.03 Compare refrigerant pressure to temperature relationships.
04.04 Identify and service refrigeration system and components.
04.05 Apply dehydration and evacuation procedures.
04.06 Service and charge a basic refrigeration system.
04.07 Locate and repair refrigeration system leaks.
04.08 Test, analyze and replace compressors.
04.09 Apply troubleshooting techniques for refrigeration systems.
04.10 Design basic refrigeration.

05.0 APPLY BASIC ELECTRICAL SKILLS--The student will be able to:

05.01 Apply basic electrical safety practices.
05.02 Identify the nature of electricity.
05.03 Identify magnetism and electromagnetism induction.
05.04 Identify electrical componenets symbols and diagrams.
05.05 Apply basic electrical theory and calculations.
05.06 Calculate and measure electrical valves in series and parallel circuits.
05.07 Compare alternating to direct current.
05.08 Test electrical components.
05.09 Test single and three phase motors.
05.10 Test capacitors.
05.11 Test solid state components.
05.12 Troubleshoot/diagnose electrical circuits.
05.13 Read schematics and diagrams.
05.14 Design electrical systems.

06.0 INSTALL AND SERVICE AIR CONDITIONING AND REFRIGERATION ELECTRICAL SYSTEMS --The student will be able to:

06.01 Install and service electrical components.
06.02 Install and service electrical controls.
06.03 Troubleshoot/diagnose electrical components and controls.
06.04 Test, analyze, remove and replace single phase motors.
06.05 Test, analyze, remove and replace three phase motors.
06.06 Test, analyze, remove and replace thermostatic controls.

07.0 INSTALL, MAINTAIN AND REPAIR RESIDENTIAL AIR CONDITIONING SYSTEMS--The student will be able to:

07.01 Install, test, analyze and repair air to air systems.
07.02 Install, test, analyze and repair water to air systems.
07.03 Install, test, analyze and repair heat pump systems.
07.04 Test and analyze air movement systems.
07.05 Apply local and national codes.
07.06 Design, construct, install and service comfort systems.
07.07 Calculate job cost estimates.

08.0 INSTALL, MAINTAIN AND REPAIR COMMERCIAL AIR CONDITIONING SYSTEMS--The student will be able to:

08.01 Install, test, analyze and repair air to air systems.
08.02 Install, test, analyze and repair water to air systems.
08.03 Install, test, analyze and repair heat pump systems.
08.04 Install, test, analyze and repair chiller systems.
08.05 Test and analyze air movement systems.
08.06 Apply local and national codes.
08.07 Install, service and repair cooling towers.
08.08 Install, service and repair water cooled condensers.
08.09 Install, service and repair water treatment systems.
08.10 Apply accepted industry pipe sizing and installation procedures.
08.11 Calculate, design and layout environmental systems.
08.12 Calculate job cost estimates.

09.0 INSTALL, MAINTAIN AND REPAIR COMMERCIAL REFRIGERATION SYSTEMS--The student will be able to:

09.01 Install, test and analyze and adjust refrigerant pressure regulating devices.
09.02 Test, analyze and replace electrical controls and components.
09.03 Test, analyze and replace defost systems.
09.04 Test, analyze and replace pump down systems.
09.05 Use various refrigeration equipment electrical diagrams.
09.06 Apply industry accepted piping installation procedures.
09.07 Apply industry pipe sizing standards.
09.08 Install, service and repair ice machines and speciality systems.
09.09 Apply local and national codes.
09.10 Calculate loads, design and layout refrigeration.
09.11 Calculate job cost estimates.

10.0 INSTALL, MAINTAIN AND REPAIR HEATING SYSTEMS--The student will be able to:

10.01 Install, service and repair a gas furnace.
10.02 Install, service and repair an oil furnace.
10.03 Install, service and repair electric furnace.
10.04 Install, service and repair duct heaters.
10.05 Install, service and repair auxiliary heat strips.
10.06 Design, install, service and repair solar heating systems.
10.07 Install, service and repair miscellaneous heating equipment.
10.08 Apply local and national codes.
10.09 Install, service and repair hydronic systems.
10.10 Test and analyze heating air movement systems.
10.11 Calculate loads, design and layout heating systems.
10.12 Calculate job cost estimates.

11.0 DEMONSTRATE BASIC HEAT GAIN, HEAT LOSS AND DESIGN SKILLS--The student will be able to:

11.01 Calculate heating and cooling requirements from specifications.
11.02 Calculate and design air distribution systems.
11.03 Determine air properties by use of psychrometerics.
11.04 Calculate cooling and heating equipment sizes.
11.05 Design, construct and install air movement systems.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Air Traffic Control

CODE NUMBER: Secondary _______ Postsecondary ATT0820

Florida CIP IN49.010500

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-15

CERTIFICATION COVERAGE: AIR CONT 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment with occupational titles as air traffic control specialists (193.162-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, Federal Aviation Administration regulations, air traffic control procedures, aviation safety, flight psychology, meteorology, navigation and communications.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in aircraft guidance systems and aircraft flight control systems in simulations and actual air traffic control environments.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

Students must meet physical and psychological standards required by the Federal Aviation Administration.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1600 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate an understanding of fundamentals of aeronautics.
02. Solve basic navigation situations.
03. Demonstrate an understanding of federal flight rules and regulations.
04. Develop an understanding of meteorology.

05. Interpret Federal Aviation Administration enroute and terminal charts and rules.
06. Demonstrate knowledge and understanding of aircraft engines and systems.
07. Demonstrate an understanding of aviation safety.
08. Demonstrate an understanding of aviation law.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS	EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education	SECONDARY NUMBER: ________
PROGRAM TITLE: Air Traffic Control	POSTSECONDARY NUMBER: ATT0820

01.0 DEMONSTRATE AN UNDERSTANDING OF FUNDAMENTALS OF AERONAUTICS--The student will be able to:

01.01 Differentiate between aeronautics and aerodynamics.
01.02 State and give examples of Newton's three laws of motion.
01.03 Name and compare the four forces of flight.
01.04 Describe an airfoil.
01.05 Tell how lift is produced.
01.06 Discuss how and why an airplane stalls.
01.07 Describe and explain how pilot, vacuum, pressure and engine instruments work.
01.08 Explain the magnetic compass.

02.0 SOLVE BASIC NAVIGATION SITUATIONS--The student will be able to:

02.01 Define radio navigation and be able to explain VOR and loran principles.
02.02 Define great circle, meridian, longitude, latitude and conic projection.
02.03 Explain and understand the sectional charts used in aviation.
02.04 Explain VOR navigation, radar, DME and RNAV principles.
02.05 Define radial, bearing, tacan, MEA, ASR, IFR, VFR and holding pattern.

03.0 DEMONSTRATE AN UNDERSTANDING OF FEDERAL FLIGHT RULES AND REGULATIONS--The student will be able to:

03.01 Explain major portion of Parts 1, 61, 67, 91 and 830 of the Federal Aviation Regulations.

04.0 DEVELOP AN UNDERSTANDING OF METEOROLOGY--The student will be able to:

04.01 State the correct names of the major civilian and military weather organizations.
04.02 Explain why the military needs its own weather service.
04.03 Name and tell the function of at least three instruments meteorologists use in gathering weather data.
04.04 Name and give a general description of two types of weather satellites.
04.05 Interpret weather surface charts, station sequence reports, terminal reports and area forecasts.
04.06 Analyze and predict weather using meteorology charts, maps and reports.

05.0 INTERPRET FEDERAL AVIATION ADMINISTRATION ENROUTE AND TERMINAL CHARTS AND RULES--The student will be able to:

05.01 Explain enroute charts and their legend.
05.02 Explain terminal charts and understand the legend.
05.03 Understand the parts 61, 91 of the Federal Aviation Regulations.

06.0 DEMONSTRATE KNOWLEDGE AND UNDERSTANDING OF AIRCRAFT ENGINES AND SYSTEMS--The student will be able to:

06.01 Identify and describe the parts of a reciprocating engine.
06.02 Understand the difference between reciprocating engines and the jet engine.
06.03 Define turbine and ramjet principles.
06.04 Explain the electrical and hydraulic systems on small aircraft.

07.0 DEMONSTRATE AN UNDERSTANDING OF AVIATION SAFETY--The student will be able to:

07.01 Explain dangerous areas around jet aircraft, large propellor driven aircraft and around small general aviation aircraft.
07.02 Identify dangerous weather conditions.
07.03 Differentiate between various causes of airsickness.
07.04 Explain the ATC system as it operates today and the safety aspects.
07.05 Define hypoxia and hyperventilation and list the causes of each.

08.0 DEMONSTRATE AN UNDERSTANDING OF AVIATION LAW--The student will be able to:

08.01 Explain and define liability, pilot in command, owner and other terms used in aviation law.
08.02 Explain the differences between civil and military law as it relates to aviation.
08.03 List and describe the agencies both federal and international that affect aviation laws and regulations.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Aircraft Airframe Mechanics

CODE NUMBER: Secondary ____________ Postsecondary ATM0300

Florida CIP IN47.060201

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVELS(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 13-17

CERTIFICATION COVERAGE: AIR MECH 7 JET ENG TH @ 7 AIR CER TH @ 7
AC LICENSE @ 7 AE LICENSE @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as aircraft structure assemblers (61090432), aircraft body repairers (807.261-010), aircraft mechanics (621.281-014), aircraft heat and vent mechanics (806.381-014), aircraft plumbing hydraulics mechanics (862.381-010), aircraft rigging and controls mechanics (806.381-018), aircraft metal workers (806.381-054), or to provide supplemental training for persons previously or currently employed in these occupations. Instruction is designed to qualify students for Federal Aviation Administration Airframe license examinations for aviation maintenance airframe technician certification.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, Federal Aviation Regulations (FAR) Part 65 pertaining to eligibility for a mechanic certificate and rating(s).

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a classroom/laboratory setting using lecture, discussion, and demonstration. Practical hands-on experiences are also available, using the tools and equipment appropriate to the program content and in accordance with current practices in the trade.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1320 contact hours (1584 clock hours).

IV. INTENDED OUTCOMES: After successfully completing this program, the individual will be able to:

01. Perform basic electricity skills.
02. Perform basic aircraft drawing skills.
03. Demonstrate aircraft weight and balance skills.
04. Maintain aircraft fluid lines and fittings.
05. Perform aircraft materials and process skills.
06. Perform ground operations and servicing duties.
07. Perform cleaning and corrosion control operations.
08. Demonstrate mathematical skills.
09. Maintain forms and records.
10. Apply basic physics to airframe systems.
11. Demonstrate use of maintenance publications.
12. Interpret mechanic privileges.
13. Maintain wood structures.
14. Perform aircraft covering.
15. Apply aircraft finishes.
16. Repair sheetmetal structures.
17. Perform welding.
18. Perform assembly and rigging.
19. Perform airframe inspection.
20. Maintain aircraft landing gear systems.
21. Maintain hydraulic and pneumatic power systems.
22. Maintain cabin atmosphere control systems.
23. Maintain aircraft instrument systems.
24. Maintain communication and navigation systems.
25. Inspect and repair aircraft fuel systems.
26. Inspect and repair aircraft electrical systems.
27. Inspect and repair position and warning systems.
28. Maintain ice and rain control systems.
29. Inspect and repair aircraft fire protection systems.
30. Demonstrate knowledge of FAA licensing requirements.
31. Demonstrate employability skills.
32. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial SECONDARY NUMBER: ____________

PROGRAM TITLE: Aircraft Airframe Mechanics POSTSECONDARY NUMBER: ATM0300

01.0 PERFORM BASIC ELECTRICITY SKILLS--The student will be able to:

01.01 Measure capacitance and inductance.
01.02 Calculate and measure electrical power.
01.03 Measure voltage, current, resistance, continuity, and leakage.
01.04 Determine the relationship of voltage, current, and resistance in electrical circuits.
01.05 Read and interpret electrical circuit diagrams.
01.06 Inspect and service batteries.
01.07 Utilize proper electrical safety procedures.

02.0 PERFORM BASIC AIRCRAFT DRAWING SKILLS--The student will be able to:

02.01 Use drawings, symbols, and schematic diagrams.
02.02 Draw sketches of repairs and alterations.
02.03 Use blueprint information.
02.04 Use graphs and charts.

03.0 DEMONSTRATE AIRCRAFT WEIGHT AND BALANCE SKILLS--The student will be able to:

03.01 Weigh aircraft.
03.02 Perform complete weight and balance check and record data.
03.03 Utilize proper personal safety procedures.

04.0 MAINTAIN AIRCRAFT FLUID LINES AND FITTINGS--The student will be able to:

04.01 Fabricate and install rigid and flexible fluid lines and fittings.
04.02 Identify and utilize special fluid line tools.

05.0 PERFORM AIRCRAFT MATERIALS AND PROCESSES SKILLS--The student will be able to:

05.01 Identify and select appropriate nondestructive testing methods.
05.02 Perform penetrant, chemical etching, and magnetic particle inspections.
05.03 Perform basic heat-treating processes.
05.04 Identify and select aircraft hardware and materials.
05.05 Inspect and check welds.
05.06 Perform precision measurements.
05.07 Perform safety wiring techniques.

06.0 PERFORM GROUND OPERATIONS AND SERVICING DUTIES--The student will be able to:

06.01 Start, ground operate, move, service, and secure aircraft.
06.02 Identify and select fuels.
06.03 Comply with prescribed shop and personal safety procedures.

07.0 PERFORM CLEANING AND CORROSION CONTROL OPERATIONS--The student will be able to:

07.01 Identify and select cleaning materials.
07.02 Perform aircraft cleaning and corrosion control.
07.03 Identify and utilize appropriate equipment for cleaning and corrosion control.
07.04 Observe appropriate personal safety procedures for corrosive chemicals.

08.0 DEMONSTRATE MATHEMATICAL SKILLS--The student will be able to:

08.01 Extract roots and raise numbers to a given power.
08.02 Determine areas and volumes of various geometrical shapes.
08.03 Solve ratio, proportion, and percentage problems.
08.04 Perform algebraic operations.

09.0 MAINTAIN FORMS AND RECORDS--The student will be able to:

09.01 Write descriptions of aircraft condition and work performed.
09.02 Complete required maintenance forms, records, and inspections reports.

10.0 APPLY BASIC PHYSICS TO AIRFRAME SYSTEMS--The student will be able to:

10.01 Use the principles of simple mechanics, sound, fluid, and heat dynamics.

11.0 DEMONSTRATE USE OF MAINTENANCE PUBLICATIONS--The student will be able to:

11.01 Select and use FAA and manufacturer's specifications and related Regulations.
11.02 Read technical data.

12.0 INTERPRET MECHANIC PRIVILEGES--The student will be able to:

12.01 Exercise mechanic privileges within the limitations prescribed by FAR Part 65.
12.02 Comply with prescribed shop and personal safety procedures.

13.0 MAINTAIN WOOD STRUCTURES--The student will be able to:

13.01 Service and repair wood structures.
13.02 Identify wood defects.
13.03 Inspect wood structures.

14.0 PERFORM AIRCRAFT COVERING--The student will be able to:

14.01 Select and apply fabric and fiberglass covering materials.
14.02 Inspect, test and repair fabric and fiberglass.

15.0 APPLY AIRCRAFT FINISHES--The student will be able to:

15.01 Apply trim, letters and touch-up paint.
15.02 Identify and select aircraft finishing materials.
15.03 Apply paint and dope.
15.04 Inspect finishes and identify defects.

16.0 REPAIR SHEET METAL STRUCTURES--The student will be able to:

16.01 Install special rivets and fasteners.
16.02 Inspect bonded structures.
16.03 Inspect and repair plastics, honeycomb and laminated structures.
16.04 Inspect, check, service and repair windows, doors and interior furnishings.
16.05 Inspect and repair sheet-metal structures.
16.06 Install conventional rivets.
16.07 Hand form, lay out and bend sheet metal.
16.08 Identify and utilize appropriate metalworking tools and equipment.

17.0 PERFORM WELDING--The student will be able to:

17.01 Weld magnesium and titanium.
17.02 Solder stainless steel.
17.03 Fabricate tubular structures.
17.04 Solder, braze, gas-weld and arc-weld steel.
17.05 Weld aluminum and stainless steel.
17.06 Identify and utilize appropriate welding tools and equipment.

18.0 PERFORM ASSEMBLY AND RIGGING--The student will be able to:

18.01 Rig rotary-wing aircraft.
18.02 Rig fixed-wing aircraft.
18.03 Check alignment of structures.
18.04 Assemble aircraft.
18.05 Balance and rig movable structures.
18.06 Jack aircraft.
18.07 Identify and utilize appropriate rigging tools and equipment.

19.0 PERFORM AIRFRAME INSPECTION--The student will be able to:

19.01 Perform conformity airworthiness inspections.

20.0 MAINTAIN AIRCRAFT LANDING GEAR SYSTEMS--The student will be able to:

20.01 Inspect and repair landing gear retraction systems, brakes, wheels, and steering.

21.0 MAINTAIN HYDRAULIC AND PNEUMATIC POWER SYSTEMS--The student will be able to:

21.01 Repair hydraulic and pneumatic power system components.
21.02 Identify and select hydraulic fluids.
21.03 Inspect and repair hydraulic and pneumatic power systems.
21.04 Identify and utilize appropriate hydraulic and pneumatic tools and equipment.

22.0 MAINTAIN CABIN ATMOSPHERE CONTROL SYSTEMS--The student will be able to:

22.01 Repair air conditioning, pressurization, heating, and oxygen system components.
22.02 Inspect and repair heating, air conditioning and pressurization systems.
22.03 Inspect, check, troubleshoot, and repair oxygen systems.

23.0 MAINTAIN AIRCRAFT INSTRUMENT SYSTEMS--The student will be able to:

23.01 Install instruments.
23.02 Inspect and repair heading, speed, altitude, attitude, and position systems.

24.0 MAINTAIN COMMUNICATION AND NAVIGATION SYSTEMS--The student will be able to:

24.01 Inspect and check auto-pilot and approach control systems.
24.02 Inspect and service electronic communication and navigation systems.
24.03 Inspect and repair antenna and electronic equipment installations.
24.04 Identify and utilize special electronic tools and equipment.

25.0 INSPECT AND REPAIR AIRCRAFT FUEL SYSTEMS--The student will be able to:

25.01 Check and service fuel dump systems.
25.02 Perform fuel management, transfer and defueling.
25.03 Inspect, check and repair pressure fuel systems.
25.04 Repair aircraft fuel system components.
25.05 Inspect and repair fluid-quantity indicating systems.
25.06 Troubleshoot and repair fluid and temperature warning systems.
25.07 Inspect, check, service, troubleshoot and repair aircraft fuel systems.

26.0 INSPECT AND REPAIR AIRCRAFT ELECTRICAL SYSTEMS--The student will be able to:

26.01 Repair aircraft electrical-system components.
26.02 Install and service electric indicators, protective devices, wiring, and controls.
26.03 Inspect and repair AC- and DC-current electrical systems.
26.04 Identify and utilize appropriate electrical tools and equipment.

27.0 INSPECT AND REPAIR POSITION AND WARNING SYSTEMS--The student will be able to:

27.01 Inspect, check and service speed- and take-off-warning systems, electrical brake controls, and anti-skid systems.
27.02 Inspect and repair landing-gear and position-indicating warning systems.

28.0 MAINTAIN ICE- AND RAIN-CONTROL SYSTEMS--The student will be able to:

28.01 Inspect, service and repair airframe ice- and rain-control systems.

29.0 INSPECT AND REPAIR AIRCRAFT FIRE PROTECTION SYSTEMS--The student will be able to:

29.01 Inspect and service smoke- and carbon monoxide-detection systems.
29.02 Inspect and repair fire-detection and fire-extinguishing systems.

30.0 DEMONSTRATE KNOWLEDGE OF FAA LICENSING REQUIREMENTS--The student will be able to:

30.01 Complete the FAA Airframe Examination.
30.02 Display an FAA Airframe Mechanic's license.

31.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

31.01 Conduct a job search.
31.02 Secure information about a job.
31.03 Identify documents which may be required when applying for a job interview.
31.04 Complete a job application form correctly.
31.05 Demonstrate competency in job interview techniques.
31.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other employees.
31.07 Identify and adopt acceptable work habits.
31.08 Demonstrate knowledge of how to make job changes appropriately.
31.09 Demonstrate acceptable employee health habits.

32.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

32.01 Define entrepreneurship.
32.02 Describe the importance of entrepreneurship to the American economy.
32.03 List the advantages and disadvantages of business ownership.
32.04 Identify the risks involved in ownership of a business.
32.05 Identify the necessary personal characteristics of a successful entrepreneur.
32.06 Identify the business skills needed to operate a small business efficiently and effectively.

NOTE: A student may elect to progress from Airframe Mechanic subjects into Power Plant Mechanic subjects without repeating the General Aviation skills. Upon completion of both the Airframe and the Power Plant competencies, the student will qualify as an Airframe and Power Plant (A and P) Mechanic.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Aircraft Piloting and Navigation

CODE NUMBER: Secondary ______ Postsecondary ATF0500

Florida CIP IN49.010200

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-15

CERTIFICATION COVERAGE: TEC AERO 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment with occupational titles as commercial aircraft pilots (196.263-014), flight engineers (621.261-018), or to provide supplemental training for persons previously or currently employed in these occupations.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, Federal Aviation Administration pilot certification procedures, aircraft systems and components, flight safety, applied physics and aerodynamics, and instrumentation.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in pre-flight preparation, primary flight, instrument and flight maneuvering, and commercial pilot preparation.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 12.0, Language 12.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1600 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate an understanding of safe and efficient work practices.
02. Demonstrate an understanding of fundamentals of aeronautics.
03. Understand and explain Federal Aviation Administration pilot certification procedures.
04. Demonstrate understanding of meteorology.
05. Demonstrate knowledge of aircraft communication equipment.
06. Demonstrate knowledge and an understanding of aircraft engine systems.
07. Solve navigation problems.

08. Demonstrate understanding of Federal Aviation Administration flight rules and regulations.
09. Demonstrate proficiency in instrument assisted flight.
10. Interpret Federal Aviation Administration enroute and terminal flight charts.
11. Demonstrate knowledge of aircraft weight and balance computations.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Aircraft Piloting and Navigation POSTSECONDARY NUMBER: ATF0500

01.0 DEMONSTRATE AN UNDERSTANDING OF SAFE AND EFFICIENT WORK PRACTICES--The student will be able to:

01.01 Demonstrate an awareness and understanding of health and safety hazards, prevention and correction of ecological problems and know the solutions unique to the industry.
01.02 Demonstrate an awareness and understanding of fueling hazards.
01.03 Demonstrate an awareness and understanding of physical hazards.
01.04 Demonstrate an awareness and understanding of fire hazards.
01.05 Demonstrate an awareness of and the ability to control and extinguish fires.
01.06 Demonstrate an awareness and understanding for the need of safety devices, controls, guards and equipment.
01.07 Demonstrate awareness, understanding and use of personal safety devices such as goggles, masks, helmets, hearing protectors, air respirators and protective clothing.

02.0 DEMONSTRATE AN UNDERSTANDING OF FUNDAMENTALS OF AERONAUTICS--The student will be able to:

02.01 Differentiate between aeronautics and aerodynamics.
02.02 State and give examples of Newton's three laws of motion.
02.03 Name and compare the four forces of flight.
02.04 Describe an airfoil.
02.05 Tell how lift is produced.
02.06 Discuss how and why an airplace stalls.
02.07 Describe and explain how pilot, vacuum, pressure and engine instruments work.
02.08 Explain the magnetic compass.

03.0 UNDERSTAND AND EXPLAIN FEDERAL AVIATION ADMINISTRATION PILOT CERTIFICATION PROCEDURES--The student will be able to:

03.01 Explain major portion of Parts 1, 61, 67, 91 and 830 of the Federal Aviation Regulations.

04.0 DEMONSTRATE UNDERSTANDING OF METEOROLOGY--The student will be able to:

04.01 State the correct names of the major civilian and military weather organizations.
04.02 Name and tell the function of at least three instruments meteorologists use in gathering weather data.
04.03 Name and give a general description of two types of weather satellites.
04.04 Interpret weather surface charts, station sequence reports, terminal reports and area forecasts.

05.0 DEMONSTRATE KNOWLEDGE OF AIRCRAFT COMMUNICATION EQUIPMENT--The student will be able to:

05.01 Use and explain function of VHF radios.
05.02 Use and explain function of UHF radios.
05.03 Explain function and frequencies of ELT's.
05.04 Use proper phraseology in using radios.
05.05 Discuss uses and limitations of portable transceivers.

06.0 DEMONSTRATE KNOWLEDGE AND AN UNDERSTANDING OF AIRCRAFT ENGINE SYSTEMS--The student will be able to:

06.01 Describe and identify reciprocating and turbine engine components.
06.02 Compute displacement, compression ration, volumetric efficiency and I.H.P. problems.
06.03 Describe and sketch a basic float type carburetor.
06.04 Describe the advantages of a fuel injected engine.
06.05 Describe a typical lubrication system on an opposed engine.
06.06 Describe a typical magneto ignition system including proper magneto checks.
06.07 Describe the difference between a normally aspirated engine and one that is supercharged.

06.08 Demonstrate basic operation of an aircraft engine including proper interpretation of instruments and operation of throttle, mixture control, carburetor heat control and prop control.

07.0 SOLVE NAVIGATION PROBLEMS--The student will be able to:

07.01 Define radio navigation.
07.02 Explain the magnetic compass.
07.03 Explain VOR navigation
07.04 Explain the ADF.
07.05 Explain DME and RNAV principles.
07.06 Demonstrate usage of magnetic coordinates.
07.07 Demonstrate and explain the flight computer.
07.08 Explain sectional charts and their use.
07.09 Explain enroute and terminal charts.
07.10 Explain lost communications emergency procedures VFR and IFR.
07.11 Read and interpret aircraft performance charts.
07.12 Plot and explain a cross country course.

08.0 DEMONSTRATE UNDERSTANDING OF FEDERAL AVIATION ADMINISTRATION FLIGHT RULES AND REGULATIONS--The student will be able to:

08.01 Explain major portions of Parts 1, 61, 67, 91 and 830 of the Federal Aviation Rules and Regulations.

09.0 DEMONSTRATE PROFICIENCY IN INSTRUMENT ASSISTED FLIGHT--The student will be able to:

09.01 Define Instrument Flight Rules.
09.02 Demonstrate proper usage of radio communications.
09.03 Demonstrate proper use of navigation equipment.
09.04 Explain how IFR flight differs from VFR.
09.05 Demonstrate proper navigation by instruments using a flight simulator.

10.0 INTERPRET FEDERAL AVIATION ADMINISTRATION ENROUTE AND TERMINAL FLIGHT CHARTS--The student will be able to:

10.01 Explain enroute and terminal chart legends.
10.02 Demonstrate and explain an enroute chart.
10.03 Demonstrate and explain a terminal chart.
10.04 Explain an approach plate.
10.05 Define SID's and STAR's.

11.0 DEMONSTRATE KNOWLEDGE OF AIRCRAFT WEIGHT AND BALANCE COMPUTATIONS--The student will be able to:

11.01 Define weight and balance.
11.02 Define center of gravity, moment, datum line, CG envelope, basic empty weight and gross weight.
11.03 Use calculator and performance charts.
11.04 Solve given weight and balance problems.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Aircraft Power Plant Mechanics

CODE NUMBER: Secondary ____________ Postsecondary ATM0190

Florida CIP IN47.060202

SECONDARY SCHOOL CREDITS _______ COLLEGE CREDITS _______ POSTSECONDARY ADULT VOCATIONAL CREDITS _______

APPLICABLE LEVELS(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 13-17

CERTIFICATION COVERAGE: AIR MECH 7 JET ENG TH @ 7 AIR CER TH @ 7 AC LICENSE @ 7 AE LICENSE @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as aircraft mechanics (621.281-014), aircraft heat and vent mechanics (806.381-014), aircraft plumbing hydraulics mechanics (862.381-010), aircraft rigging and controls mechanics (806.381-018), aircraft metal workers (806.381-054), or to provide supplemental training for persons previously or currently employed in these occupations. Instruction is designed to qualify students for Federal Aviation Administration Airframe license examinations for aviation maintenance power plant technician certification.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, Federal Aviation Regulations (FAR) Part 65 pertaining to eligibility for a mechanic certificate and rating(s).

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a classroom/laboratory setting using lecture, discussion, and demonstration. Practical hands-on experiences are also available, using the tools and equipment appropriate to the program content and in accordance with current practices in the trade.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1320 contact hours (1584 clock hours).

02. Perform basic aircraft drawing skills.
03. Demonstrate aircraft weight and balance skills.
04. Maintain aircraft fluid lines and fittings.
05. Perform aircraft materials and process skills.
06. Perform ground operations and servicing duties.
07. Perform cleaning and corrosion control operations.
08. Demonstrate mathematical skills.
09. Maintain forms and records.
10. Apply basic physics to airframe systems.
11. Demonstrate use of maintenance publications.
12. Interpret mechanic privileges.
13. Perform basic turbine engine skills.
14. Perform engine inspection.
15. Perform engine inspection.
16. Maintain engine instrument systems.
17. Maintain engine fire protection systems.
18. Maintain engine electrical systems.
19. Maintain lubrication systems.
20. Maintain ignition systems.
21. Maintain fuel metering systems.
22. Maintain engine fuel systems.
23. Maintain induction systems.
24. Maintain engine cooling systems.
25. Maintain engine exhaust systems.
26. Maintain aircraft propellers.
27. Demonstrate knowledge of FAA licensing requirements.
28. Demonstrate employability skills.
29. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial SECONDARY NUMBER: ____________

PROGRAM TITLE: Aircraft Power Plant Mechanics POSTSECONDARY NUMBER: ATM0190

01.0 PERFORM BASIC ELECTRICITY SKILLS--The student will be able to:

01.01 Measure capacitance and inductance.
01.02 Calculate and measure electrical power.
01.03 Measure voltage, current, resistance, continuity, and leakage.
01.04 Determine the relationship of voltage, current, and resistance in electrical circuits.
01.05 Read and interpret electrical circuit diagrams.
01.06 Inspect and service batteries.
01.07 Utilize proper electrical safety procedures.

02.0 PERFORM BASIC AIRCRAFT DRAWING SKILLS--The student will be able to:

02.01 Use drawings, symbols, and schematic diagrams.
02.02 Draw sketches of repairs and alterations.
02.03 Use blueprint information.
02.04 Use graphs and charts.

03.0 DEMONSTRATE AIRCRAFT WEIGHT AND BALANCE SKILLS--The student will be able to:

03.01 Weigh aircraft.
03.02 Perform complete weight and balance check and record data.
03.03 Utilize proper personal safety procedures.

04.0 MAINTAIN AIRCRAFT FLUID LINES AND FITTINGS--The student will be able to:

04.01 Fabricate and install rigid and flexible fluid lines and fittings.
04.02 Identify and utilize special fluid line tools.

05.0 PERFORM AIRCRAFT MATERIALS AND PROCESSES SKILLS--The student will be able to:

05.01 Identify and select appropriate nondestructive testing methods.
05.02 Perform penetrant, chemical etching, and magnetic particle inspections.
05.03 Perform basic heat-treating processes.
05.04 Identify and select aircraft hardware and materials.
05.05 Inspect and check welds.
05.06 Perform precision measurements.
05.07 Perform safety wiring techniques.

06.0 PERFORM GROUND OPERATIONS AND SERVICING DUTIES--The student will be able to:

06.01 Start, ground operate, move, service, and secure aircraft.
06.02 Identify and select fuels.
06.03 Comply with prescribed shop and personal safety procedures.

07.0 PERFORM CLEANING AND CORROSION CONTROL OPERATIONS--The student will be able to:

07.01 Identify and select cleaning materials.
07.02 Perform aircraft cleaning and corrosion control.
07.03 Identify and utilize appropriate equipment for cleaning and corrosion control.
07.04 Observe appropriate personal safety procedures for corrosive chemicals.

08.0 DEMONSTRATE MATHEMATICAL SKILLS--The student will be able to:

08.01 Extract roots and raise numbers to a given power.
08.02 Determine areas and volumes of various geometrical shapes.
08.03 Solve ratio, proportion, and percentage problems.
08.04 Perform algebraic operations.

09.0 MAINTAIN FORMS AND RECORDS--The student will be able to:

09.01 Write descriptions of aircraft condition and work performed.
09.02 Complete required maintenance forms, records, and inspections reports.

10.0 APPLY BASIC PHYSICS TO AIRFRAME SYSTEMS--The student will be able to:

10.01 Use the principles of simple mechanics, sound, fluid, and heat dynamics.

11.0 DEMONSTRATE USE OF MAINTENANCE PUBLICATIONS--The student will be able to:

11.01 Select and use FAA and manufacturer's specifications and related Regulations.
11.02 Read technical data.

12.0 INTERPRET MECHANIC PRIVILEGES--The student will be able to:

12.01 Exercise mechanic privileges within the limitations prescribed by FAR Part 65.
12.02 Comply with prescribed shop and personal safety procedures.

13.0 PERFORM BASIC RECIPROCATING ENGINE SKILLS--The student will be able to:

13.01 Inspect and repair a 14-cylinder or larger radial engine.
13.02 Overhaul a reciprocating engine.
13.03 Inspect, check, service, and repair opposed and radial engines and reciprocating engine installations.
13.04 Install, troubleshoot, and remove reciprocating engines.

14.0 PERFORM BASIC TURBINE ENGINE SKILLS--The student will be able to:

14.01 Overhaul a turbine engine.
14.02 Inspect, check, service, and repair turbine engines and turbine engine installations.
14.03 Install, troubleshoot, and remove turbine engines.

15.0 PERFORM ENGINE INSPECTION--The student will be able to:

15.01 Perform power plant conformity and airworthiness inspections.
15.02 Perform appropriate safety wiring checks.

16.0 MAINTAIN ENGINE INSTRUMENT SYSTEMS--The student will be able to:

16.01 Troubleshoot, service, and repair fluid rate-of-flow indicating systems.
16.02 Inspect, check, service, and repair engine pressure, temperature, and r.p.m. indicating systems.

17.0 MAINTAIN ENGINE FIRE PROTECTION SYSTEMS--The student will be able to:

17.01 Inspect, check, service, troubleshoot, and repair engine fire detection and extinguishing systems.
17.02 Perform appropriate safety wiring check and repairs.

18.0 MAINTAIN ENGINE ELECTRICAL SYSTEMS--The student will be able to:

18.01 Repair engine electrical system components.
18.02 Install engine electrical wiring controls, switches, indicators, and protective devices.
18.03 Identify and utilize special electrical tools and equipment.

19.0 MAINTAIN LUBRICATION SYSTEMS--The student will be able to:

19.01 Identify and select lubricants.
19.02 Repair engine lubrication system components.
19.03 Inspect, check, service, troubleshoot, and repair engine lubrication systems.

20.0 MAINTAIN IGNITION SYSTEMS--The student will be able to:

20.01 Overhaul magneto and ignition harness.
20.02 Repair engine ignition system components.
20.03 Inspect, check, service, troubleshoot, and repair reciprocating and turbine engine ignition systems.

21.0 MAINTAIN FUEL METERING SYSTEMS--The student will be able to:

21.01 Inspect, check, and service water injection systems.
21.02 Overhaul carburetors.
21.03 Repair engine fuel metering system components.
21.04 Inspect, troubleshoot, and repair reciprocating and turbine engine fuel metering systems.
21.05 Perform safety wiring techniques.

22.0 MAINTAIN ENGINE FUEL SYSTEMS--The student will be able to:

22.01 Repair engine fuel system components.
22.02 Inspect, check, service, troubleshoot, and repair engine fuel systems.
22.03 Perform appropriate safety wiring checks and repairs.

23.0 MAINTAIN INDUCTION SYSTEMS--The student will be able to:

23.01 Inspect, check, troubleshoot, service, and repair engine ice- and rain-control systems.
23.02 Inspect, check, service, and repair heat exchangers and superchargers.
23.03 Inspect, check, service, and repair carburetor air intake and induction manifolds.

24.0 MAINTAIN ENGINE COOLING SYSTEMS--The student will be able to:

24.01 Repair engine cooling system components.
24.02 Inspect, check, troubleshoot, service, and repair engine cooling systems.

25.0 MAINTAIN ENGINE EXHAUST SYSTEMS--The student will be able to:

25.01 Repair engine exhaust system components.
25.02 Inspect, check, troubleshoot, service, and repair engine exhaust systems.

26.0 MAINTAIN AIRCRAFT PROPELLERS--The student will be able to:

26.01 Inspect, check, service, and repair propeller synchronizing and ice-control systems.
26.02 Identify and select propeller lubricants.
26.03 Balance propellers.
26.04 Repair propeller control-system components.
26.05 Inspect and repair fixed-pitch, constant-speed, and feathering propellers and governing systems.
26.06 Install, troubleshoot, and remove propellers.

27.0 DEMONSTRATE KNOWLEDGE OF FAA LICENSING REQUIREMENTS--The student will be able to:

27.01 Complete the FAA Power Plant Examination.
27.02 Display an FAA Power Plant Mechanic's license.

28.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

28.01 Conduct a job search.
28.02 Secure information about a job.
28.03 Identify documents which may be required when applying for a job interview.
28.04 Complete a job application form correctly.
28.05 Demonstrate competency in job interview techniques.
28.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other employees.

28.07 Identify and adopt acceptable work habits.
28.08 Demonstrate knowledge of how to make job changes appropriately.
28.09 Demonstrate acceptable employee health habits.

29.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

29.01 Define entrepreneurship.
29.02 Describe the importance of entrepreneurship to the American economy.
29.03 List the advantages and disadvantages of business ownership.
29.04 Identify the risks involved in ownership of a business.
29.05 Identify the necessary personal characteristics of a successful entrepreneur.
29.06 Identify the business skills needed to operate a small business efficiently and effectively.

NOTE: A student may elect to progress from Airframe Mechanic subjects into Power Plant Mechanic subjects without repeating the General Aviation skills. Upon completion of both the Airframe and Power Plant competencies, the student will qualify as an Airframe and Power Plant (A and P) Mechanic.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Architectural Design and Construction Technology

CODE NUMBER: Secondary ______ Postsecondary VAR0110

Florida CIP IN15.010100

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-15

CERTIFICATION COVERAGE: TEC DRAFT @7 BLDG CONSTR @7 TEC CONSTR @7 DRAFTING 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as landscape drafters (001.261-014), specification writers (019.267-010), estimators (160.267-018), building inspectors (168.167-030), and construction inspectors (182.267-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, assisting architects and architectural engineers in planning and designing structures, using construction materials, and dealing with constrasts and specifications.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in model building, construction material utilization, testing materials and examining structures to determine their compliance with building codes and architectural design.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1600 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Communicate effectively.
02. Identify, select, apply, and maintain drafting and graphic materials and equipment.
03. Identify construction materials and their application.
04. Interpret drawings and documents.
05. Interpret and apply basic principles of architectural and engineering design.
06. Interpret and apply codes, regulations, and technical literzture.
07. Produce architectural working drawings.
08. Produce structural drawings in steel and concrete.
09. Prepare subcontractor shop drawings.

10. Survey and assess construction sites.
11. Estimate basic quantities.
12. Perform office and administrative procedures.
13. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS

ARCHITECTURAL DESIGN AND CONSTRUCTION TECHNOLOGY

01.0 COMMUNICATE EFFECTIVELY — The student will be able to:

- 01.01 Identify communication channels in organization.
- 01.02 Develop and use effective means of communications.
- 01.03 Develop effective working relationships with others.
- 01.04 Prepare business correspondence, memos, and reports.
- 01.05 Compose clear and concise oral and written technical reports and presentations.
- 01.06 Participate in technical discussion and meetings.

02.0 IDENTIFY, SELECT, APPLY, AND MAINTAIN DRAFTING AND GRAPHIC MATERIALS AND EQUIPMENT — The student will be able to:

- 02.01 Apply functions of light table.
- 02.02 Apply architectural and engineering scales.
- 02.03 Identify and select drawing materials.
- 02.04 Select, apply, and maintain basic drawing instruments.
- 02.05 Identify, apply, and maintain lettering instruments.
- 02.06 Identify and select leads, lead holders, sharpeners and erasers.
- 02.07 Identify and select reproduction materials.
- 02.08 Identify, operate, and maintain reproduction equipment.
- 02.09 Select and apply architectural and engineering curves and templates.
- 02.10 Set up and maintain drafting machine, T squares, and parallel rule.
- 02.11 Identify, select, and apply commercial press on graphic materials.
- 02.12 Operate and maintain inking equipment and materials.
- 02.13 Identify, select, and apply color markers and pencils.
- 02.14 Identify, select, and apply water base colors.
- 02.15 Select and apply scribing materials and instruments.
- 02.16 Operate calculators.
- 02.17 Perform basic calculations with slide rule.
- 02.18 Measure area using planimeter.
- 02.19 Identify and apply metric system.
- 02.20 Identify, operate, and maintain photography equipment.
- 02.21 Apply photographic techniques.
- 02.22 Apply and develop lettering and drawing techniques.

03.0 IDENTIFY CONSTRUCTION MATERIALS AND THEIR APPLICATION — The student will be able to:

- 03.01 Identify formwork materials and methods.
- 03.02 Identify concrete materials and applications.
- 03.03 Identify reinforcing steel and applications.
- 03.04 Identify structural steel shapes and applications.
- 03.05 Identify waterproofing materials and vapour barriers and applications.
- 03.06 Identify wood construction materials and applications.
- 03.07 Identify masonry materials and applications.
- 03.08 Identify exterior finishes and applications.
- 03.09 Identify insulation materials and applications.
- 03.10 Identify glass and glazing materials and applications.
- 03.11 Identify roofing materials and applications.
- 03.12 Identify flashings and applications.
- 03.13 Identify adhesives and sealants and applications.
- 03.14 Identify floor finish materials and applications.
- 03.15 Identify wall finish materials and applications.
- 03.16 Identify ceiling finish materials and applications.
- 03.17 Identify plastic materials and applications.
- 03.18 Identify miscellaneous metals and applications.
- 03.19 Identify millwork and applications.
- 03.20 Identify finish hardware and applications.
- 03.21 Identify manufactured specialties and applications.
- 03.22 Identify basic electrical components.
- 03.23 Identify basic H V A C components.
- 03.24 Identify basic plumbing components.
- 03.25 Identify paving materials and applications.
- 03.26 Identify fire proofing materials and applications.
- 03.27 Identify applications of pre-engineered and prefabricated structures.

04.0 INTERPRET DRAWINGS AND DOCUMENTS — The student will be able to:

- 04.01 Interpret technical symbols.
- 04.02 Interpret topographical drawings.

04.03 Interpret aerial photographs and maps.
04.04 Interpret site drawings.
04.05 Interpret architectural drawings.
04.06 Interpret specifications.
04.07 Interpret addendums.
04.08 Interpret notice of change and change orders.
04.09 Interpret shop drawings.
04.10 Interpret structural drawings.
04.11 Interpret mechanical drawings.
04.12 Interpret electrical drawings.
04.13 Interpret modular approach to buildings.
04.14 Identify and interpret contracts.
04.15 Identify and interpret liens.
04.16 Interpret deeds.
04.17 Interpret master and development plans and documents.

05.0 INTERPRET AND APPLY BASIC PRINCIPLES OF ARCHITECTURAL AND ENGINEERING DESIGN — The student will be able to:

05.01 Conduct and interpret concrete slump test.
05.02 Take test cylinder and interpret results.
05.03 Interpret soil analysis reports.
05.04 Interpret compaction test reports.
05.05 Interpret theory of loads.
05.06 Determine effect of loads on materials.
05.07 Interpret principles of expansion and contraction and control.
05.08 Interpret and apply fundamentals of site requirements.
05.09 Determine and apply space relationships.

06.0 INTERPRET AND APPLY CODES, REGULATIONS, AND TECHNICAL LITERATURE — The student will be able to:

06.01 Interpret and apply graphic and time saver standards.
06.02 Interpret and apply national building codes.
06.03 Interpret and apply C. M. H. C. residential standards.
06.04 Interpret and apply national fire code.
06.05 Interpret and apply provincial codes and regulations.
06.06 Interpret and apply municipal codes and regulations.
06.07 Interpret zoning bylaws and regulations.
06.08 Interpret zoning maps.
06.09 Interpret trade magazines and catalogs.
06.10 Interpret trade manuals.
06.11 Interpret C. I. C. T. manual.
06.12 Interpret yardstick costing manual.
06.13 Interpret and apply C. E. T. regulations.
06.14 Interpret and apply construction association regulations.

07.0 PRODUCE ARCHITECTURAL WORKING DRAWINGS — The student will be able to:

07.01 Prepare floor plan drawings.
07.02 Prepare foundation plan and detail drawings.
07.03 Prepare elevation drawings.
07.04 Prepare landscape layouts.
07.05 Prepare schedules.
07.06 Prepare sections.
07.07 Build architectural models.
07.08 Prepare truss drawings.
07.09 Prepare stairway drawings.
07.10 Prepare fireplace drawings.
07.11 Prepare plot plan drawings.

08.0 PRODUCE STRUCTURAL DRAWINGS IN STEEL AND CONCRETE — The student will be able to:

08.01 Draw beam connections.
08.02 Draw structural assemblies.
08.03 Prepare erection plans.
08.04 Prepare structural drawings.
08.05 Make take-offs from reinforced concrete engineering drawings.
08.06 Prepare footing and foundation drawings.
08.07 Prepare column detail drawings.

08.08 Prepare floor and roof detail drawings.
08.09 Prepare special structure detail drawings.
08.10 Prepare framed beam connection drawings.
08.11 Prepare stiffened seat connection drawings.
08.12 Prepare bolted column detail drawings.
08.13 Prepare gusset plate drawings.

09.0 PREPARE SUBCONTRACTOR SHOP DRAWINGS — The student will be able to:

09.01 Prepare plumbing plan drawings.
09.02 Prepare climate control drawings.
09.03 Prepare electrical plan drawings.

10.0 SURVEY AND ASSESS CONSTRUCTION SITES — The student will be able to:

10.01 Select and apply measuring tapes and chains.
10.02 Prepare site sketches.
10.03 Apply methods of on site measuring.
10.04 Interpret survey books and logs.
10.05 Identify and apply basic principles of levels and rods.
10.06 Identify and apply basic principles of transits.
10.07 Interpret angular and distance measurements to bearings and azimuth.
10.08 Outline basics of site meetings and inspection.

11.0 ESTIMATE BASIC QUANTITIES — The student will be able to:

11.01 Compute area and volume of buildings.
11.02 Estimate quantities of excavation and fill.
11.03 Take off quantities of form work.
11.04 Take off quantities of concrete.
11.05 Take off quantities of lumber.
11.06 Take off quantities of masonry.
11.07 Interpret and complete standard estimators forms.

12.0 PERFORM OFFICE AND ADMINISTRATIVE PROCEDURES — The student will be able to:

12.01 Organize and maintain personal work area.
12.02 Operate office equipment.
12.03 Estimate, order, and maintain drafting supplies.
12.04 Maintain file drawing system.
12.05 Maintain record of building costs.
12.06 Develop and maintain technical reference library.
12.07 Identify basic project management systems.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS—The student will be able to:

13.01 List sources of job openings other than public or private employment agencies.
13.02 Write a letter of application for a job.
13.03 Prepare a vita, resume or personal fact sheet.
13.04 List factors to consider when applying for a job.
13.05 List ways of making contact with employers.
13.06 Identify documents which may be required when applying for a job interview.
13.07 Complete a job application form correctly.
13.08 Identify appropriate dress and grooming for job interview.
13.09 Classify behaviors considered appropriate or inappropriate in a job interview situation.
13.10 Describe advantages to employer and employees of being a productive worker.
13.11 Explain the purpose of supervision, self discipline, and performance evaluation.
13.12 Identify appropriate response(s) to criticism from employer, supervisor or other employees.
13.13 List consequences of being absent frequently from the job.
13.14 List consequences of frequently arriving late for work.
13.15 List factors to consider when resigning from a job.
13.16 Write a letter of resignation.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Architectural Drafting

CODE NUMBER: Secondary ______ Postsecondary VAR0210

Florida CIP IN48.010200

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other __13-17__

CERTIFICATION COVERAGE: DRAFTING 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment with occupational titles as architectural drafters (001.261-010), commercial drafters (017.261-026), heating and ventilating drafters (017.261-034), assistant drafters (017.281-018), plumbing drafters (017.261-038), or to provide supplemental training for persons previously or currently employed in these occupations.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and skills to support architects and architectural engineers in developing plans for buildings or other structures using a variety of materials.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in creating layouts and designs in keeping with building codes, zoning lays, ordinances, and other regulations and in styling and planning in keeping within cost limitations and client preferences.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of orientation information.
02. Apply basic drafting skills.
03. Solve technical mathematical problems.
04. Prepare multiview drawings.
05. Prepare sectional views.
06. Prepare auxilary drawings.

07. Apply basic dimensions.
08. Prepare pictoral drawings.
09. Prepare surface developments.
10. Utilize drafting applications.
11. Prepare basic charts and graphs.
12. Prepare basic computer aided drawings.
13. Prepare basic architectural drawings.
14. Prepare basic structural details.
15. Prepare basic map drawings.
16. Prepare civil drawings.
17. Prepare basic electrical/electronic drawings.
18. Prepare basic pneumatic/hydraulic drawings.
19. Prepare advance computer aided drawings.
20. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS

ARCHITECTURAL DRAFTING

01.0 DEMONSTRATE KNOWLEDGE OF ORIENTATION INFORMATION — The student will be able to:

01.01 Identify school, classroom and grading policies.
01.02 Apply safety practices.
01.03 Identify drafting careers and occupational concepts.
01.04 Identify course overview.
01.05 Locate resource materials and audio-visual training equipment.
01.06 Utilize reproduction equipment i.e., blueprint machines and office copy equipment.

02.2 APPLY BASIC DRAFTING SKILLS — The student will be able to:

02.01 Utilize drafting equipment, measuring scales, drawing media, drafting instruments and consumable materials.
02.02 Apply conversion tables for fractions, decimals, and metric measurements.
02.03 Identify the use of the alphabet of lines.
02.04 Prepare title blocks and other drafting formats.
02.05 Perform various freehand and other lettering techniques.
02.06 Apply geometric construction techniques.
02.07 Prepare axonometric, oblique, and prospective sketches.
02.08 Interpret reports and specifications.

03.0 SOLVE TECHNICAL MATHEMATICAL PROBLEMS — The student will be able to:

03.01 Solve arithmetic problems.
03.02 Solve algebra problems.
03.03 Solve trigonometry problems.
03.04 Solve geometry problems.
03.05 Apply multiple discipline calculations.

04.0 PREPARE MULTI-VIEW DRAWING — The student will be able to:

04.01 Select proper drawing scale, views, and layout.
04.02 Prepare drawings containing horizontal and vertical surfaces.
04.03 Prepare drawings containing circles and/or arcs.
04.04 Prepare drawing containing incline surface(s).
04.05 Prepare drawings incorporating partial views.
04.06 Prepare drawings incorporating removed detail and conventional breaks.

05.0 PREPARE SECTIONAL VIEWS — The student will be able to:

05.01 Prepare drawings containing full sections and half sections.
05.02 Prepare drawings containing offset sections.
05.03 Prepare drawings containing revolved sections.
05.04 Prepare drawings containing removed sections and broken-out sections.
05.05 Develop conventional representation.
05.06 Prepare a sectional-assembly drawing applying material symbols.

06.0 PREPARE AUXILIARY DRAWINGS — The student will be able to:

06.01 Prepare drawings containing primary auxiliary views.
06.02 Prepare drawings containing auxiliary views that include curved lines.
06.03 Prepare drawings containing auxiliary sections.
06.04 Prepare drawings containing secondary auxiliary views.

07.0 APPLY BASIC DIMENSIONS — The student will be able to:

07.01 Prepare drawings containing linear standard dimensions.
07.02 Prepare drawings that include angular standard dimensions.
07.03 Prepare drawings that include circular standard dimensions.
07.04 Prepare drawings using metric dimensions.
07.05 Prepare drawings using general and local notes.
07.06 Prepare drawings using surface characteristic notations.

08.0 PREPARE PICTORIAL DRAWINGS — The student will be able to:

08.01 Prepare isometric drawings.
08.02 Prepare dimetric drawings.
08.03 Prepare cavalier drawings.

08.04 Prepare cabinet drawings.
08.05 Prepare one and two point perspectives.

09.0 PREPARE SURFACE DEVELOPMENTS — The student will be able to:

09.01 Prepare drawings with stretchouts of prisms, cylinders, cones and pyramids.
09.02 Prepare stretchouts of transition piece(s).
09.03 Prepare drawing involving intersecting pieces.

10.0 UTILIZE DRAFTING APPLICATIONS — The student will be able to:

10.01 Identify and use the various drafting and graphic appliques.
10.02 Perform cut and paste techniques.
10.03 Identify and use photo techniques.
10.04 Prepare overlay drawings.
10.05 Make drawing changes on a sepia.
10.06 Apply inking techniques.

11.0 PREPARE BASIC CHARTS AND GRAPHS — The student will be able to:

11.01 Prepare bar, pie, and flow charts.
11.02 Prepare rectangular and semi-logarithmic graphs.

12.0 PREPARE BASIC COMPUTER AIDED DRAWINGS — The student will be able to:

12.01 Operate full size standard keyboard.
12.02 Operate dual disc drive console.
12.03 Operate monitor.
12.04 Operate digitzer.
12.05 Operate plotter (single and multipen).
12.06 Format, transfer and operate diskette.
12.07 Produce multi-view drawings with dimensions.
12.08 Produce section view drawings with dimensions.
12.09 Produce auxiliary view drawings with dimensions.
12.10 Produce pictorial drawings.
12.11 Produce charts and graphs.

13.0 PREPARE BASIC ARCHITECTURAL DRAWINGS — The student will be able to:

13.01 Interpret vendors catalogs and technical tables.
13.02 Prepare floor plan drawings, with dimensions.
13.03 Prepare foundation plan and detail drawings, with dimensions.
13.04 Prepare elevation drawings with dimensions.
13.05 Prepare sections with dimensions.
13.06 Prepare schedules.
13.07 Prepare landscape layout.

14.0 PREPARE BASIC STRUCTURAL DETAILS — The student will be able to:

14.01 Interpret structural steel and reinforcing concrete manuals and technical tables.
14.02 Draw structural steel beam connections.
14.03 Draw reinforcing bar details.

15.0 PREPARE BASIC MAP DRAWINGS — The student will be able to:

15.01 Prepare traverse drawings.
15.02 Prepare plat drawings.
15.03 Prepare street layout drawings.
15.04 Prepare map drawings.

16.0 PREPARE CIVIL DRAWINGS — The student will be able to:

16.01 Prepare topographic drawings.
16.02 Prepare drainage drawings.
16.03 Prepare highway drawings.

17.0 PREPARE BASIC ELECTRICAL/ELECTRONIC DRAWINGS — The student will be able to:

17.01 Prepare schematic drawings.
17.02 Prepare printed circuit board drawings.
17.03 Prepare package drawings.

18.0 PREPARE BASIC PNEUMATIC/HYDRAULIC DRAWINGS — The student will be able to:

18.01 Prepare piping drawings.
18.02 Prepare pictorial diagrams.
18.03 Prepare cutaway diagrams.
18.04 Prepare graphical diagrams.
18.05 Prepare combination diagrams.

19.0 PREPARE ADVANCE COMPUTER AIDED DRAWINGS — The student will be able to:

19.01 Produce architectural drawings.
19.02 Produce structural steel and reinforcing detail drawings.
19.03 Produce map drawings.
19.04 Produce civil drawings.
19.05 Produce electrical/electronic drawings.
19.06 Produce pneumatic/hydraulic drawings.

20.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS — The student will be able to:

20.01 List sources of job openings other than public or private employment agencies.
20.02 Write a letter of application for a job.
20.03 Prepare a vita, resume, or personal fact sheet.
20.04 List factors to consider when applying for a job.
20.05 List ways of making contact with employers.
20.06 Identify documents which may be required when applying for a job interview.
20.07 Complete a job application form correctly.
20.08 Identify appropriate dress and grooming for a job interview.
20.09 Classify behaviors considered appropriate or inappropriate in a job interview situation.
20.10 Describe advantage to employer and employees of being a productive worker.
20.11 Explain the purpose of supervision, self discipline, and performance evaluation.
20.12 Identify appropriate response(s) to criticism from employer, supervisor, or other employees.
20.13 List consequences of being absent frequently from the job.
20.14 List consequences of frequently arriving late for work.
20.15 List factors to consider when resigning from a job.
20.16 Write a letter of resignation.

CURRICULUM FRAMEWORK **PROGRAM AREA:** Industrial

FLORIDA DEPARTMENT OF EDUCATION **EFFECTIVE DATE:** July, 1987

PROGRAM TITLE: Automotive Body Repair and Refinishing

CODE NUMBER: Secondary ____________ Postsecondary ARR0900

Florida CIP IN47.060300

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ___________

APPLICABLE LEVELS(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 13-17

CERTIFICATION COVERAGE: AUTO IND @ 7 AUTO BODY 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as automobile body repairers (807.391-010), automotive painters (845.381-014), automobile body repairer helpers (807.687-010), and automotive painter helpers (845.684-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, basic trade skills, refinishing skills, sheet metal repair skills, frame and unibody squaring and aligning, use of fillers, paint systems and undercoats, related welding skills, related mechanical skills, trim-hardware maintenance, glass servicing, and other miscellaneous repairs.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in, but are not limited to, use of hand and power tools, panel repairs, use of spray equipment, use of frame and alignment equipment, application of body fillers, paint systems, use of shop materials, glass replacement, and the use of MIG, oxyacetylene, and plastic welders.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communications, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 contact hours (2160 clock hours).

IV. INTENDED OUTCOMES: After sucessfully completing this program, the individual will be able to:

01. Demonstrate shop and occupational safety skills
02. Prepare vehicles for repair and refinishing
03. Repair, replace, and adjust outer body panels
04. Prepare parts and panels for metal finishing
05. Prepare and apply body-fillers
06. Repair fiber glass and plastic components
07. Perform welding operations
08. Operate diagnostic equipment
09. Inspect, measure, and repair unibody vehicles
10. Inspect and repair frame-type vehicle bodies
11. Prepare surfaces for refinishing
12. Maintain and operate spray equipment
13. Select and apply appropriate paints and finishes
14. Diagnose and correct paint-application problems
15. Diagnose and correct finish defects
16. Perform miscellaneous repairs
17. Demonstrate employability skills
18. Demonstrate an understanding of entrepreneurship

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ___________

PROGRAM TITLE: Automotive Body Repair and Refinishing POSTSECONDARY NUMBER: ARR0900

01.0 DEMONSTRATE SHOP AND OCCUPATIONAL SAFETY SKILLS--The student will be able to:

01.01 Comply with safety rules regarding chemicals
01.02 Comply with safety rules regarding personal clothing and devices
01.03 Comply with safety rules regarding hand tools and power equipment
01.04 Comply with shop safety rules and regulations
01.05 Identify sources of airborne contamination and other hazards; take necessary steps to protect the health of the painter and other personnel
01.06 Inspect air makeup and exhaust systems (including intake filters, exhaust filters, fans and other mechanical components of the system) to insure proper filtering and ventilation
01.07 Identify career opportunities in auto body repair
01.08 Explain requirements for continuing education in auto body repair

02.0 PREPARE VEHICLES FOR REPAIR AND REFINISHING--The student will be able to:

02.01 Diagnose and analyze damage to determine appropriate methods for over-all repair
02.02 Remove damaged outside trim and moldings
02.03 Remove damaged or necessary inside trim and moldings
02.04 Remove damaged, nonstructural body panels and components that may interfere with, or be damaged during, repair
02.05 Remove all vehicle mechanical components that may interfere with, or be damaged during, repair; replace after repair
02.06 Protect panels and parts adjacent to repair areas to prevent damage
02.07 Remove dirt, corrosion, undercoatings, sealers, and/or other protective coatings necessary to perform repairs to structural areas
02.08 Remove repairable plastics and other parts that are recommended for off-car repair

03.0 REPAIR, REPLACE, AND ADJUST OUTER BODY PANELS--The student will be able to:

03.01 Remove and replace a bolted panel or panel assembly
03.02 Remove and replace a welded sheet-metal panel or panel assembly
03.03 Remove and replace a welded aluminum panel or panel assembly
03.04 Remove and replace hoods, hood hinges, and hood latches
03.05 Remove and replace deck lids, lid hinges, and lid latches
03.06 Remove and replace doors, tailgates, hatches, liftgates, and hinges
03.07 Remove and replace bumpers, reinforcements, guards, isolators, and mounting hardware (release pressure from gas- and oil-filled energy-absorbing-type bumper isolators that are being discarded)
03.08 Check and adjust hood clearances to adjoining panels
03.09 Check and adjust deck lid, liftgate, and hatch clearances to adjoining panels
03.10 Check door-hinge condition; check door frames for square; check and adjust door clearances (where adjustable) along quarter panels, doors, rocker panels, fenders, and tops
03.11 Check and adjust latch assemblies on all hinged components
03.12 Check and adjust bumper clearances to adjacent body and filler panels
03.13 Straighten roughed-out contours of damaged panels to a surface condition for body filling or metal finishing
03.14 Weld cracked or torn steel body-panels; reweld broken welds
03.15 Heat-shrink stretched panel-areas back to contour
03.16 Cold-shrink stretched panel-areas back to contour
03.17 Restore protective coatings and sealants

03.18 Braze body-panels only in locations recommended by vehicle manufacturers
03.19 Repair or replace door skins and intrusion beams

04.0 PREPARE PARTS AND PANELS FOR METAL FINISHING--The student will be able to:

04.01 Identify specification(s) of metals used in automobiles
04.02 Identify heat effects on metals
04.03 Identify the importance of maintaining the structural integrity of an auto body
04.04 Grind the paint from the damaged area of a body panel
04.05 Pick and file the damaged area of a body panel to eliminate surface irregularities
04.06 Disc-sand the repaired body-panel to produce final smoothness

05.0 PREPARE AND APPLY BODY-FILLERS--The student will be able to:

05.01 Mix plastic filler
05.02 Apply plastic body-filler and cheese-grate during curing
05.03 Rough-sand cured plastic body-filler to contour, and then finish-sand
05.04 Tin surfaces to be leaded with acid, ruby fluid, etc. (OPTIONAL)
05.05 Clean surfaces of body panels to avoid trapping acid under the lead (OPTIONAL)
05.06 Neutralize the tinning-agent acid (OPTIONAL)
05.07 Clean and file surfaces of body panels for solder filling (OPTIONAL)
05.08 Apply and paddle body-solder (OPTIONAL)
05.09 Grind and file body-solder to contour, then finish-sand (OPTIONAL)

06.0 REPAIR FIBER GLASS AND PLASTIC COMPONENTS--The student will be able to:

06.01 Repair deep gouges and cracks in fiber glass panels
06.02 Repair holes in fiber glass panels
06.03 Replace fiber glass body-panels and straighten/align panel supports
06.04 Remove damaged areas from fiber glass panels and repair with partial-panel installation
06.05 Identify the type of plastic to be repaired and the appropriate repair procedure (including hot-air welding, chemical bonding, and the use of structural adhesives)
06.06 Prepare the surfaces of, and repair damage to, thermoplastic parts
06.07 Prepare the surfaces of, and repair damage to, thermosetting-plastic parts

07.0 PERFORM WELDING OPERATIONS--The student will be able to:

07.01 Set up, operate, and maintain MIG, spot, oxyacetylene, and other welding equipment
07.02 Apply basic metal applications
07.03 Comply with manufacturers' specifications for joining metal

08.0 OPERATE DIAGNOSTIC EQUIPMENT--The student will be able to:

08.01 Recognize types of diagnostic equipment
08.02 Diagnose and measure frame damage using self-centering gauges
08.03 Diagnose and measure frame damage using a tram gauge
08.04 Diagnose and measure frame damage using a datum-line gauge

09.0 INSPECT, MEASURE, AND REPAIR UNIBODY VEHICLES--The student will be able to:

09.01 Recognize that measuring, dimensioning, and tolerance limits in unibody vehicles are critical to repair of these vehicles, and that suspension mount-points and engine power-train attaching-points are critical to vehicle 4-wheel alignment (potential vibration and steering problems can result if these are improperly positioned) and adjust these in accordance with vehicle manufacturers' recommendations

09.02 Recognize that bent or damaged steering, suspension, and power-train components can cause vibration, steering, and 4-wheel alignment problems and replace them in accordance with vehicle manufacturers'recommendations
09.03 Diagnose and measure unibody damage using self-centering gauges
09.04 Diagnose and measure unibody damage using a tram gauge
09.05 Diagnose and measure unibody damage using a datum-line gauge
09.06 Determine the location of all suspension, steering, and power-train component attaching-points to the body
09.07 Diagnose and measure unibody damage using a dedicated (fixture) measuring system
09.08 Diagnose and measure unibody damage using a universal measuring system or a laser
09.09 Determine the extent of the direct and indirect damage and the direction of impact, and plan the method and order of repair
09.10 Attach proper body-anchoring devices
09.11 Straighten and align cowl assemblies
09.12 Straighten and align roof pillars and roof panels
09.13 Straighten and align door posts
09.14 Straighten and align door sills, floor pans, and rocker panels
09.15 Straighten and align quarter panels, wheel-house assemblies, and rear body-sections (including rail, suspension, and power-train mounting-points)
09.16 Straighten/align front-end sections (aprons, strut towers, upper/lower rails, steering, suspension, and power-train mounting-points, etc.)
09.17 Recognize the limitations of applying heat to high-strength steel structural components, use proper heat-stress relief methods on high-strength steel, and weld in accordance with vehicle manufacturers' recommendations
09.18 Use proper cold-stress relief methods
09.19 Remove folds, curves, creases, and dents using power tools and hand tools to restore damaged areas to proper contours and dimensions
09.20 Determine the extent of damage to structural-steel body panels and repair, weld, or replace them in accordance with manufacturers' specifications
09.21 Determine the extent of damage to structural-aluminum body panels and repair, weld, or replace them in accordance with manufacturers'specifications
09.22 Cut out damaged sections of structural steel body-panels and weld in replacements in accordance with manufacturers' specifications
09.23 Cut out damaged sections of structural aluminum body-panels and weld in replacements in accordance with manufacturers' specifications
09.24 Recheck panel contour and alignment after shaping, and correct or adjust as necessary
09.25 Clean, prime, and protective-coat repaired unibody structural areas

10.0 INSPECT AND REPAIR FRAME-TYPE VEHICLE BODIES--The student will be able to:

10.01 Determine the extent of direct and indirect damage and the direction of impact, and plan methods and order of repairs
10.02 Straighten and align mash damage
10.03 Straighten and align sag damage
10.04 Straighten and align sidesway damage
10.05 Straighten and align twist damage
10.06 Straighten and align kickup damage
10.07 Straighten and align broadside damage
10.08 Straighten and align diamond frame damage
10.09 Remove and replace damaged frame horns, side rails, cross members, and front or rear frame-sections, and weld cracks in frame members
10.10 Clean, prime, and protective-coat repaired frame areas
10.11 Repair, reinforce, or replace weakened frame members in accordance with vehicle manufacturers' recommendations
10.12 Straighten and align cowl assemblies
10.13 Straighten and align roof pillars and roof panels
10.14 Straighten and align door posts
10.15 Straighten and align door sills, floor pans, and rocker panels

10.16 Straighten and align quarter panels, wheel-house assemblies, and rear body-sections
10.17 Remove folds, curves, creases, and dents using power tools and hand tools to restore damaged areas to proper contours and dimensions
10.18 Weld cracked or torn sheet-steel body-panels and reweld broken welds
10.19 Weld cracked or torn aluminum body-panels and reweld broken welds
10.20 Cut out damaged sections of sheet-steel body-panels and weld in replacements
10.21 Cut out damaged sections of aluminum body-panels and weld in replacements
10.22 Heat-shrink stretched panel-areas back to contour
10.23 Cold-shrink stretched panel-areas back to contour
10.24 Recheck panel contour and alignment after shaping and correct or adjust as necessary

11.0 PREPARE SURFACES FOR REFINISHING--The student will be able to:

11.01 Inspect and identify types of finishes and surface conditons and develop a plan for refinishing
11.02 Remove and store trim and molding
11.03 Remove dirt, wax, and road grime from areas to be refinished and from adjacent surfaces
11.04 Mask trim and other areas that will not be refinished
11.05 Remove paint finishes (chemically or mechanically)
11.06 Dry- or wet-sand areas to be refinished
11.07 Feather-edge broken areas to be refinished
11.08 Identify types of metals and apply suitable metal treatments
11.09 Mix primer, primer-surfacer, or primer-sealer and spray onto the surface of repaired areas
11.10 Apply glazing putty to pin-holes, scratches, and other minor surface imperfections
11.11 Dry- or wet-sand areas to which primer-surfacer and glazing putty have been applied
11.12 Compound around the edges of repaired areas to be refinished
11.13 Blow dust from areas to be refinished including cracks or moldings of adjacent areas
11.14 Clean area to be refinished with a proper solvent
11.15 Remove, with a tack rag, any dust or lint particles from the areas to be refinished
11.16 Apply suitable sealers to the areas being refinished when sealing is needed or desirable

12.0 MAINTAIN AND OPERATE SPRAY EQUIPMENT--The student will be able to:

12.01 Check and adjust air pressure at the spray gun
12.02 Adjust spray-gun fluid and pattern-control valves
12.03 Use appropriate spray techniques (gun arc, gun angle, gun distance, gun speed, and spray-pattern overlap) for the finish being applied
12.04 Inspect, clean, and determine the condition and adequacy of spray guns and related equipment (air hoses, regulators, air lines, and compressors)

13.0 SELECT AND APPLY APPROPRIATE PAINTS AND FINISHES--The student will be able to:

13.01 Select the proper spray mask, inspect the spray mask to insure proper fit and operation, and inspect the condition of the mask filters and other components
13.02 Determine the type and color of paint already on a vehicle
13.03 Shake, stir, thin or reduce, and strain paint
13.04 Apply acrylic enamel for spot repairs
13.05 Apply acrylic enamel for panel repairs
13.06 Apply acrylic enamel for over-all refinishing
13.07 Apply polyurethane enamel for panel and over-all refinishing
13.08 Apply alkyd enamel for panel and over-all refinishing
13.09 Apply acrylic lacquer for spot repairs
13.10 Apply acrylic lacquer for panel repairs
13.11 Apply acrylic lacquer for over-all refinishing

13.12 Check for color-matching of all applied materials
13.13 Apply acrylic-lacquer clearcoat for spot repairs
13.14 Apply acrylic-lacquer clearcoat for panel and over-all repairs
13.15 Apply enamel clearcoat for spot repairs
13.16 Apply enamel clearcoat for panel and over-all repairs
13.17 Sand, buff, and polish finishes where necessary
13.18 Identify the types of plastic parts to be finished and determine the proper refinishing procedure
13.19 Apply a finish coat to plastic parts
13.20 Clean, condition, and refinish vinyl (e.g. upholstery, dashes, and tops)
13.21 Clean and detail a vehicle after completion of refinishing
13.22 Apply stone-chip-resistant coatings to lower body areas
13.23 Restore corrosion-resistant coatings, caulking, and seam sealers to repaired areas
13.24 Apply decals, transfers, tapes, wood-grains, pinstripings (painted and taped), etc.

14.0 DIAGNOSE AND CORRECT PAINT-APPLICATION PROBLEMS--The student will be able to:

14.01 Identify blistering or raising of the paint surface, determine the cause(s), and correct the condition
14.02 Identify blushing (milky or dull mist-formation), determine the cause(s), and correct the condition
14.03 Identify bull's-eye effects in the paint surface, determine the cause(s), and correct the condition
14.04 Identify crow's-feet a or crazing appearance in the paint surface, determine the cause(s), and correct the condition
14.05 Check for dirt in the painted surface, determine the source(s), and correct the condition
14.06 Identify a dry-spray pattern in the paint surface, determine the cause(s), and correct the condition
14.07 Identify the appearance of fisheyes in the finish after it has been applied, determine the cause(s), and correct the condition
14.08 Identify lifting (surface distortion or shriveling) while the topcoat is being applied, identify the cause(s), and correct the condition
14.09 Identify molting (or streaking) in metallic-paint finishes, determine the cause(s), and correct the condition
14.10 Identify the orange-peel appearance of the refinished surface, determine the cause(s), and correct the condition
14.11 Identify overspray resulting from overlap, determine the cause(s), and correct the condition
14.12 Identify a pin-holing (solvent-popping) appearance in a freshly-painted surface, determine the cause(s), and correct the condition
14.13 Identify sags and runs in paint surfaces, determine the cause(s), and correct the condition
14.14 Identify sand-scratch swelling, determine the cause(s), and correct the condition
14.15 Identify shrinking or splitting while the finish is drying around repaired areas, determine the cause(s), and correct the condition
14.16 Identify that a color-coat is off-shade or does not match, determine the cause(s), and correct the condition
14.17 Identify tape-tracking, determine the cause(s), and correct the condition
14.18 Identify bleeding, determine the cause(s), and correct the condition

15.0 DIAGNOSE AND CORRECT FINISH DEFECTS--The student will be able to:

15.01 Identify poor adhesion, determine the cause(s), and take action to correct the condition
15.02 Identify paint-cracking (crow's-feet or line-checking, micro-checking, etc.) and take action to correct the condition
15.03 Identify the orange-peel appearance of a finished surface and take action to correct the condition
15.04 Check for rust spots on the surface, determine the cause(s), and take action to correct the condition

15.05 Identify a pin-holing (solvent-popping) or blistering appearance in paint surfaces, determine the cause(s), and take action to correct the condition
15.06 Identify water-spotting on paint surfaces and take action to correct the condition
15.07 Identify wrinkling of enamel and take action to correct the condition
15.08 Identify buffing-wheel burns on a painted surface, determine the cause(s), and take action to correct the condition
15.09 Identify finish damage caused by bird droppings, tree sap, and other natural causes and take action to correct the condition
15.10 Identify finish damage caused by airborne overspray, acids, soot, and other industrial-related causes and take action to correct the condition
15.11 Identify die-back conditions (both dulling of the paint film showing haziness and film distortion showing shrinking) and take action to correct the condition
15.12 Identify chalking (or oxidation) and take action to correct the condition

16.0 PERFORM MISCELLANEOUS REPAIRS--The student will be able to:

16.01 Inspect, adjust, repair, or replace window regulators, run channels, glass, power mechanisms, and related controls
16.02 Repair/replace all power-driven accessories and related controls (including electrically-heated glass)
16.03 Diagnose and repair water leaks, dust leaks, and wind noises
16.04 Inspect, repair, or replace weatherstripping
16.05 Inspect, remove, and replace all stationary glass (including windshields, back lights, etc.) using manufacturers' recommended installation materials and procedures
16.06 Inspect, repair or replace, and adjust removable manually-operated or electrically-operated roof panels, hinges, latches, guides, handles, retainers, and controls of sun roofs
16.07 Inspect, repair, and replace convertible tops and related mechanisms (OPTIONAL)
16.08 Remove and replace vinyl tops
16.09 Repair damaged circuits and wires
16.10 Remove, replace, and cap off air-conditioner components
16.11 Evacuate and recharge air conditioning systems
16.12 Identify procedures to remove and replace engines and mounts
16.13 Identify procedures to remove and replace transmissions and mounts
16.14 Identify procedures to remove and replace suspension parts
16.15 Identify procedures to remove and replace brake parts
16.16 Identify procedures to bleed brakes
16.17 Identify procedures to remove and replace fuel system components
16.18 Identify procedures to perform front-end alignment
16.19 Align headlamps
16.20 Apply rust-repair methods including grinding, sandblasting, and metal preparation
16.21 Install metal inserts; epoxy, fiber glass or suitable fillers; and undercoating
16.22 Detail and clean up a car after job completion

17.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

17.01 Conduct a job search.
17.02 Secure information about a job.
17.03 Identify documents that may be required when applying for a job.
17.04 Complete a job application form correctly.
17.05 Demonstrate competence in job interview techniques.
17.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
17.07 Identify acceptable work habits.
17.08 Demonstrate knowledge of how to make job changes appropriately.
17.09 Demonstrate acceptable employee health habits.

18.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP

18.01 Define entrepreneurship
18.02 Describe the importance of entrepreneurship to the American economy
18.03 List the advantages and disadvantages of business ownership
18.04 Identify the risks involved in ownership of a business
18.05 Identify the necessary personal characteristics of a successful entrepreneur
18.06 Identify the business skills needed to operate a small business efficiently and effectively

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Automotive Machine Shop

CODE NUMBER: Secondary ______ Postsecondary MTR0590

Florida CIP IN48.050301

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-17

CERTIFICATION COVERAGE: AUTO MACH 7 TOOL DIE @ 7
METAL WORK @ 7 AUTO IND @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as machinists (50061206), filers, grinders, buffers, chippers (61082401), machine tool operators, combination (61021402), all-around machinists (600.280-022), automotive machinists (600.280-034), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, remanufacture of automotive engines to original factory specifications, make judgements on when to remachine or replace components, remachine components for engine rebuild, recognize metal fatigue, and manufacture unusual or special parts when necessary.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in cleaning, inspecting, grinding, drilling, honing, and reassembling automotive parts with an emphasis on accuracy.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0 , Language 8.0 . This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1500 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Explain the principles of power.
02. Identify and use precision and non-precision hand tools.
03. Explain proper cleaning methods.
04. Disassemble and inspect engines.
05. Clean automotive engine components.
06. Surface grind heads.
07. Machine finish complete head.

Automotive Machine Shop - Continued

08. Machine connecting rods and main bearing caps for finish honing.
09. Remachine cylinder walls.
10. Service pistons.
11. Service brake drums, disc brake system, and shoes.
12. Perform magnaflux nondestructive testing.
13. Service crankshaft.
14. Service flywheels and clutches.
15. Operate engine lathe.
16. Operate milling machine.
17. Operate drill press.
18. Demonstrate employability skills.
19. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ___________

PROGRAM TITLE: Automotive Machine Shop POSTSECONDARY NUMBER: MTR0590

01.0 EXPLAIN THE PRINCIPLES OF POWER--The student will be able to:

01.01 Demonstrate understanding of internal combustion engines.
01.02 Demonstrate understanding of concepts of heat, pressure, and compression as they relate to the internal combustion engine.
01.03 Explain differences between two and four cycle engines.
01.04 Demonstrate understanding of shop safety procedures.

02.0 IDENTIFY AND USE PRECISION AND NON-PRECISION HAND TOOLS--The student will be able to:

02.01 Select and use personal safety equipment.
02.02 Select, use, and maintain taps, dies, hones, drills, and reamers.
02.03 Select, use, and maintain punches, saws, chisels, and files.
02.04 Select and use micrometers, calipers, dial indicators, depth gauges, boring gauges, and plastigage.

03.0 EXPLAIN PROPER CLEANING METHODS--The student will be able to:

03.01 Identify types of soils.
03.02 Demonstrate understanding of chemicals and processes used for cleaning, including emulsion, parts washers, and cola and hot tanks.
03.03 Explain glass bead cleaning.

04.0 DISASSEMBLE AND INSPECT ENGINES--The student will be able to:

04.01 Remove and disassemble cylinder heads.
04.02 Remove and disassemble crankshafts, camshafts, rods, and pistons.
04.03 Inspect all parts and compare to acceptable tolerances.

05.0 CLEAN AUTOMOTIVE ENGINE COMPONENETS--The student will be able to:

05.01 Perform hot tank block cleaning.
05.02 Perform hot tank head cleaning.
05.03 Perform hot tank crankshaft cleaning.
05.04 Perform hot tank camshaft cleaning.
05.05 Bead clean valves and head.
05.06 Explain and demonstrate appropriate safety behavior while performing hot tank cleaning.

06.0 SURFACE GRIND HEADS--The student will be able to:

06.01 Set up and operate grinder.
06.02 Dress grinder wheel.
06.03 Inspect and replace grinder wheel.
06.04 Inspect finished heads.

07.0 MACHINE FINISH COMPLETE HEAD

07.01 Set up I. D. L. Machining Center to replace valve guides and seats.
07.02 Machine guides to proper size.
07.03 Machine valve seats.
07.04 Replace valve seats.

08.0 MACHINE CONNECTING RODS AND MAIN BEARING CAPS FOR FINISH HONING--The student will be able to:

08.01 Mark all rods and caps.
08.02 Check for bends and cracks.
08.03 Straighten rods.
08.04 Grind caps with rod and cap grinder.
08.05 Hone all rods.
08.06 Hone main bearing surfaces.

09.0 REMACHINE CYLINDER WALLS--The student will be able to:

09.01 Inspect cylinder blocks for damage.
09.02 Repair damaged areas.
09.03 Measure all cylinder bones.
09.04 Machine cylinder bones.
09.05 Hone cylinder walls.

09.06 Resleeve cylinder walls.

10.0 SERVICE PISTONS--The student will be able to:

10.01 Clean and inspect pistons.
10.02 Resize ring grooves.
10.03 Expand pistons (peening and knurling).
10.04 Fit piston pins.

11.0 SERVICE BRAKE DRUMS, DISC BRAKE SYSTEM AND SHOES--The student will be able to:

11.01 Clean, inspect, and measure components to be machined.
11.02 Set up and operate brake machining center.

12.0 PERFORM MAGNAFLUX NON-DESTRUCTIVE TESTING--The student will be able to:

12.01 Demonstrate understanding of magnaflux testing theory.
12.02 Perform testing by magnetizing with contacts.
12.03 Perform testing by magnetizing with coil.
12.04 Perform testing by magnetizing with a yoke.
12.05 Perform dye penetrate test.
12.06 Maintain testing equipment.

13.0 SERVICE CRANKSHAFTS--The student will be able to:

13.01 Check shaft in place.
13.02 Check shaft out of engine.
13.03 Straighten crankshaft.
13.04 Grind crankshaft.

14.0 SERVICE FLYWHEELS AND CLUTCHES--The student will be able to:

14.01 Inspect flywheels and clutch plates for wear and fatigue.
14.02 Measure and grind flywheels and clutch plates.

15.0 OPERATE ENGINE LATHE--The student will be able to:

15.01 Perform turning operations.
15.02 Perform facing operations.
15.03 Perform boring operations.
15.04 Perform drilling operations.

16.0 OPERATE MILLING MACHINE--The student will be able to:

16.01 Perform face milling operations
16.02 Perform climb operations.
16.03 Perform conventional operations.
16.04 Perform end operations.

17.0 OPERATE DRILL PRESS--The student will be able to:

17.01 Sharpen drills.
17.02 Perform drilling operations in press.
17.03 Perform ?????? operations.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct a job search.
18.02 Secure information about a job.
18.03 Identify documents which may be required when applying for a job interview.
18.04 Complete a job application form correctly.
18.05 Demonstrate competence in job interview techniques.
18.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
18.07 Identify acceptable work habits.
18.08 Demonstrate knowledge of how to make job changes appropriately.
18.09 Demonstrate acceptable employee health habits.

19.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

19.01 Define entrepreneurship.
19.02 Describe the importance of entrepreneurship to the American economy.
19.03 List the advantages and disadvantages of business ownership.
19.04 Identify the risks involved in ownership of a business.
19.05 Identify the necessary personal characteristics of a successful entrepreneur.
19.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Automotive Mechanics

CODE NUMBER: Secondary __________ Postsecondary AER0990

Florida CIP IN47.060400

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 13-17

CERTIFICATION COVERAGE: AUTO MECH 7 AUTO IND @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as automobile mechanics (620.261-010), engine repair specialist (620.261-010), automatic transmission specialist (620.261-062), transmission and rear axle specialist (620.281-062) front end specialist (620.281-038), brake specialist (620.281-026) electrical system specialist (825.281-022), engine tune up specialist (620.281-066), heating and air conditioning specialist (620.281-010) automobile service station attendant (620.261-030), new and used car get ready mechanic (806.361-026), automotive electronics specialist (828.281-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The program provides instruction in diagnosis of malfunctions in the repair of engines, fuel, electrical, cooling and brake systems; drive train and suspension systems; and radiators, transmission and carburetors.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, basic management concepts, troubleshooting skills, and servicing, maintaining, and repairing all mechanical systems or gasoline and diesel powered automobiles including fuel, electrical, cooling, brake drive, suspension and related systems.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in theory, fundamentals, service, and rebuilding of the following areas: engine repair, automatic and manual transmissions, drive trains, steering, suspension brakes, electrical systems, engine systems performance, and automotive accessories. The tools, equipment, materials, and processes used in the laboratory should be equal to those used in the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction is utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on thejob and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 2160 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the individual will be able to:

01.0 Demonstrate basic knowledge of automotive mechanics.
02.0 Apply electrical and electronic skills in diagnosing/troubleshooting malfunctions of electrical/electronic components
03.0 Demonstrate proficiency in servicing steering, suspension, & wheel systems.
04.0 Demonstrate proficiency in automotive brake service
05.0 Demonstrate proficiency in servicing cooling, air conditioning & heating systems.
06.0 Demonstrate proficiency in engine performance service.
07.0 Demonstrate proficiency in automatic transmission/trans axle service.
08.0 Demonstrate proficiency in servicing manual drive trains & axles.
09.0 Demonstrate proficiency in engine repair service.
10.0 Demonstrate proficiency in management skills
11.0 Demonstrate employability skills.
12.0 Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial SECONDARY NUMBER

PROGRAM TITLE: Automotive Mechanics PROGRAM NUMBER: AER0990

01.0 DEMONSTRATE BASIC KNOWLEDGE OF AUTOMOTIVE MECHANICS--The student will be able to:

01.01 Apply shop safety rules and procedures.
01.02 Use and maintain hand tools such as screwdrivers, special-application pliers, hammers, chisels, punches, special-application wrenches and sockets, files, hacksaws, bench vises, and c-clamps.
01.03 Demonstrate use of precision measuring tools.
01.04 Apply electrical safety rules and procedures.
01.05 Apply fire safety rules and procedures.
01.06 Apply basic welding skills related to the automobile industry.
01.07 Use and maintain power tools such as drills, bench grinders, drill presses, hydraulic presses, impact wrenches, air chisels, parts washers, hydraulic jacks, and vehicle hoists.
01.08 Use and apply basic electrical and electronic test equipment and meters.
01.09 Use and install fasteners such as screws and bolts, key screw. extractors, helicoil inserts, and thread cutting taps and dies.
01.10 Apply basic math skills.
01.11 Apply metric math skills.
01.12 Lubricate and service chassis.
01.13 Demonstrate use of multiple- and single-volume type shop manuals.
01.14 Demonstrate use of specification handbooks and tuneup charts.
01.15 Demonstrate use of Motors, Chilton, Mitchell and other service manuals.
01.16 Understand electrical terms, magnetism, electrical current flow and Ohms' law, and sources.
01.17 Understand and apply the rules of series circuits.
01.18 Understand and apply the rules of parallel circuits.
01.19 Understand and apply the rules of series-parallel circuits.
01.20 Understand steering geometry and suspension geometry such as caster, camber, toe-in, kingpin inclination (steering axis), and toe-in and toe-out on turns.
01.21 Understand the function of steering and suspension system components such as coil springs, leaf springs, torsion bars, twin "I" beams, quadralink, rubber bushings, shock absorbers, tie rods, ball joints, shackles, idler arm, pitman arm, and control arm.
01.22 Understand manual and power steering operation--integral and linkage types--such as power steering pump, power steering control valve, and power steering fluid leaks.
01.23 Understand drum brake operation such as adjusters, wheel cylinder, pull, grab, chatter, noise, pulsations, fade, and lining conditions.
01.24 Understand disc brake operation such as caliper, piston, pull, grab, chatter, pulsations, fade, and lining conditions.
01.25 Understand brake system valve operation such as pressure. differential valve, proportional valve, metering valve, and brake warning light.
01.26 Understand pedal height.
01.27 Demonstrate an understanding of basic heating and cooling systems.
01.28 Understand basic air conditioning systems.
01.29 Demonstrate knowledge of engine component functions and driveability.
01.30 Understand basic ignition and fuel systems.
01.31 Understand rear axle operation such as differential action; limited slip mechanisms; floating, non-floating, and semi-floating.
01.32 Understand drive shaft operation, drive shaft construction, and universal joint operation such as single joint, constant velocity, joint working angle, joint phasing, slip joint joint, splined output, and splined drive shaft.
01.33 Understand automatic transmission operation such as fluid coupling, torque converter, plantary gear system, power flow, hydraulic system, lubricant, and cooling.
01.34 Understand clutch operation.
01.35 Understand clutch release mechanisms, to include linkage and hydraulic.

01.36 Understand manual transmission operation such as torque multiplication, power flow, sliding gears, constant mesh gear, synchronizer action, and shift mechanisms.
01.37 Understand overdrive operation.
01.38 Demonstrate knowledge of internal engine components.
01.39 Demonstrate an understanding of advanced electronics concepts.
01.40 Demonstrate an understanding of electronic schematic diagrams and diagnostic techniques.
01.41 Demonstrate an understanding of electrical/electronic wire repair procedures.
01.42 Demonstrate an understanding of electronic semiconductor concepts and components.
01.43 Demonstrate an understanding of electronic transistor concepts and components.
01.44 Demonstrate an understanding of electronic microprocessor concepts, functions, and components.
01.45 Diagnose and correct malfunctions in computer control systems.
01.46 Diagnose, test and replace on-board computer controls.
01.47 Diagnose, service and replace computerized sensors.
01.48 Adjust door hinges and striker plates.
01.49 Locate and seal air and water leaks.
01.50 Locate and seal duct leaks.
01.51 Locate and correct rattles and noises.
01.52 Install door holdings.
01.53 Remove and replace window regulators.
01.54 Adjust window regulators.
01.55 Install air shocks.
01.56 Install C.B.'s and radios.
01.57 Touch up paint.
01.58 Lubricate hinges.
01.59 Adjust headlights.
01.60 Inspect and replace passenger restraints.
01.61 Check vehicle visibility.
01.62 Check and adjust specified fluid levels.

02.0 APPLY ELECTRICAL AND ELECTRONIC SKILLS IN DIAGNOSING/TROUBLESHOOTING MALFUNCTIONS OF ELECTRICAL/ELECTRONIC COMPONENTS (Computerized or Non-Computerized)--The student will be able to:

02.01 Diagnose engine malfunctions.
02.02 Perform power checks with test lights.
02.03 Perform continuity tests.
02.04 Measure voltage drop, current flow, and resistance in a circuit or component with a multimeter.
02.05 Locate an open circuit or a short circuit.
02.06 Analyze cranking system malfunctions.
02.07 Analyze charging system malfunctions.
02.08 Service and test batteries.
02.09 Remove and replace light bulbs.
02.10 Inspect, remove, and replace alternator belts.
02.11 Test, remove, and replace fuses and circuit breakers.
02.12 Replace and test starters.
02.13 Overhaul starters.
02.14 Test and overhaul alternators.
02.15 Remove and replace regulators.
02.16 Inspect and repair lighting systems.
02.17 Diagnose, repair or replace turn-signal and stoplight switches.
02.18 Test and replace electrical system switches.
02.19 Diagnose, repair, or replace power window and power seat systems, including motors.
02.20 Diagnose, repair, or replace horn systems.
02.21 Diagnose, repair or replace clock systems.
02.22 Diagnose, repair, or replace warning buzzer and seat belt interlock systems.
02.23 Test and replace instrument panel units.
02.24 Service windshield wiper/washer systems.
02.25 Service cruise control systems.
02.26 Test and replace units.
02.27 Check, remove, and replace radios.

03.0 DEMONSTRATE PROFICIENCY IN STEERING, SUSPENSION, and WHEEL SERVICES--The student will be able to:

03.01 Diagnose abnormal tire wear problems.
03.02 Diagnose suspension problems.
03.03 Diagnose wheel/tire vibrations, shimmy, and tramp.
03.04 Diagnose steering problems.
03.05 Lubricate suspension, steering gear, and linkage.
03.06 Check manual steering gear fluid level.
03.07 Inspect steering systems.
03.08 Inspect suspension systems.
03.09 Inspect and test shock absorbers.
03.10 Check power steering fluid level.
03.11 Replace power steering drive belts.
03.12 Identify tires by types and sizes.
03.13 Inspect and service tires and wheels.
03.14 Repair tires.
03.15 Rotate wheels and tires.
03.16 Bubble balance wheels and tires.
03.17 Spin balance wheels and tires.
03.18 Service front wheel bearings and grease seals.
03.19 Remove and replace front wheel bearings.
03.20 Remove and replace spindles and ball joints.
03.21 Remove and replace shock absorbers and mountings.
03.22 Rebuild MacPherson-type struts.
03.23 Measure and adjust torsion bar height.
03.24 Remove and replace coil springs/torsion bars.
03.25 Remove and replace control arms and bushings.
03.26 Remove and replace steering linkage components.
03.27 Remove and replace steering dampers.
03.28 Remove and replace rear suspension parts.
03.29 Remove, replace, and repair steering assemblies.
03.30 Overhaul recirculating ball manual gears.
03.31 Overhaul drolly manual gears.
03.32 Remove and replace power steering pumps.
03.33 Overhaul power steering pumps.
03.34 Overhaul integral power steering gears.
03.35 Overhaul drolly power steering gears.
03.36 Overhaul linkage-type power- steering gears.
03.37 Check 2-wheel and 4-wheel alignment.

04.0 DEMONSTRATE PROFICIENCY IN AUTOMOTIVE BRAKE SERVICE--The student will be able to:

04.01 Diagnose brake system problems.
04.02 Diagnose drolly valve malfunctions.
04.03 Diagnose proportioning valve malfunctions.
04.04 Diagnose metering valve malfunctions.
04.05 Check master cylinder fluid level.
04.06 Perform operational inspections.
04.07 Inspect brake and wheel assemblies.
04.08 Remove and replace calipers and rotors.
04.09 Refinish rotors.
04.10 Refinish calipers.
04.11 Refinish brake drums.
04.12 Replace drum brake shoes.
04.13 Adjust brake shoes.
04.14 Adjust parking brakes.
04.15 Rebuild wheel cylinders.
04.16 Remove and replace wheel cylinders.
04.17 Bleed hydraulic brakes.
04.18 Free up or replace @ B*ing brake cables and linkage.
04.19 Remove and replace master cylinders.
04.20 Remove and replace hydraulic power cylinders.
04.21 Flush brake systems.
04.22 Service and repair power assist and brake control systems.
04.23 Service and repair front and rear disc brakes.
04.24 Replace hydraulic brake boosters.

05.0 DEMONSTRATE PROFICIENCY IN COOLING, AIR CONDITIONING, and HEATING SERVICE--The student will be able to:

05.01 Inspect, remove, and replace fan belts.
05.02 Check radiator coolant level.
05.03 Test and replace coolant.
05.04 Pressure test cooling systems.
05.05 Test radiator caps.
05.06 Inspect, remove, and replace radiator and heater hoses.
05.07 Remove, test, and replace thermostats.
05.08 Flush cooling systems.
05.09 Remove and replace radiators.
05.10 Remove and replace water pumps.
05.11 Diagnose basic air conditioning system problems.
05.12 Inspect and pressure test basic air conditioning systems.
05.13 Inspect, remove, and replace air conditioning belts.
05.14 Discharge, evacuate, and charge basic air conditioning systems.
05.15 Leak test basic air conditioning systems.
05.16 Service air conditioning electrical circuits.
05.17 Service vacuum circuits.
05.18 Remove and replace components in basic air conditioning systems.
05.19 Remove and replace engine fan clutches.
05.20 Service import air conditioning systems.
05.21 Remove and replace blower motors.
05.22 Remove and replace heater cores, control units, and cables.

06.0 DEMONSTRATE PROFICIENCY IN ENGINE PERFORMANCE SERVICE--The student will be able to:

06.01 Analyze engine performance.
06.02 Perform running cylinder balance tests.
06.03 Perform cylinder compression tests.
06.04 Check the performance of engines equipped with on-board computers.
06.05 Inspect, remove, and replace points and condensers.
06.06 Remove and replace distributors.
06.07 Check distributors using a distributor tester.
06.08 Check the distributor advance in a vehicle.
06.09 Overhaul distributors.
06.10 Inspect and test primary circuits.
06.11 Remove and replace coils.
06.12 Remove and replace ignition switches and resistors.
06.13 Inspect, remove, and replace ignition wires, caps, and rotors.
06.14 Remove and replace spark plugs.
06.15 Clean and gap spark plugs.
06.16 Perform cylinder leakage tests.
06.17 Service import electronic ignition systems.
06.18 Service GM high energy ignition systems.
06.19 Diagnose GM Computer Command Control (CCC) systems.
06.20 Service Chrysler electronic ignitions.
06.21 Service Chrysler oxygen feedback systems.
06.22 Service Ford solid state ignitions.
06.23 Service Ford EEC/MCU systems.
06.24 Service air cleaners.
06.25 Inspect, remove, and replace fuel filters.
06.26 Measure fuel flow and pressure.
06.27 Remove and replace fuel lines.
06.28 Remove and replace fuel pumps.
06.29 Adjust idle speed.
06.30 Adjust idle mixture: propane.
06.31 Clean and adjust chokes.
06.32 Clean and overhaul carburetors.
06.33 Inspect, remove, and replace manifold control valves.
06.34 Remove and replace turbochargers.
06.35 Check and adjust waste gates.
06.36 Remove and replace fuel injection system filters.
06.37 Set idle speed to specifications.
06.38 Remove and replace fuel injectors.
06.39 Service throttle body fuel injection systems.
06.40 Service ported fuel injection systems.
06.41 Service PCV systems.
06.42 Service evaporative control systems.
06.43 Service thermostatic air cleaners.

06.44 Service air injecttion systems.
06.45 Inspect, remove, and replace air-pump belts.
06.46 Service EGR systems.
06.47 Service ignition timing controls.
06.48 Test exhaust emissions using an HC/CO tester.
06.49 Remove and replace catalytic converter beads.
06.50 Service diesel injectors.
06.51 Remove and replace diesel-engine fuel filters.
06.52 Check and adjust injection pump timing.
06.53 Remove and replace injection pumps.
06.54 Check and adjust idle and maximum speeds.
06.55 Test and service pre-heating systems.
06.56 Diagnose mechanical, ignition, and fuel emission problems.
06.57 Inspect exhaust systems.
06.58 Remove and replace tail pipes.
06.59 Remove and replace mufflers.
06.60 Remove and replace exhaust pipes.
06.61 Inspect, remove, and replace catalytic converters.

07.0 DEMONSTRATE PROFICIENCY IN AUTOMATIC TRANSMISSION/TRANS AXLE SERVICE--The student will be able to:

07.01 Check automatic transmission fluid level.
07.02 Performance test automatic transmissions.
07.03 Diagnose malfunctions of automatic transmissions such as fluid leaks, fluid condition, slipping, lock-up, and shift problems.
07.04 Diagnose, repair, and replace trans acxles.
07.05 Pressure test transmissions in vehicles.
07.06 Stall-test transmissions in vehicles.
07.07 Change transmission oil and filter.
07.08 Adjust linkage from the engine.
07.09 Adjust shift linkage.
07.10 Test the electrical controls of an automatic-clutch converter.
07.11 Adjust neutral safety switches.
07.12 Remove and replace external gaskets and seals.
07.13 Test vacuum shift modulators.
07.14 Adjust bands.
07.15 Service governors.
07.16 Service valve bodies.
07.17 Rebuild transmission assemblies.
07.18 Pressure-flush converter assemblies.
07.19 Pressure-flush transmission cooler assemblies.
07.20 Remove and replace extension housings and bushings.

08.0 DEMONSTRATE PROFICIENCY IN SERVICING MANUAL DRIVE TRAINS & AXLES--The student will be able to:

08.01 Diagnose drive-line problems.
08.02 Diagnose and performance test manual transmission problems.
08.03 Inspect drive shafts, U-joints, and center bearings.
08.04 Lubricate universal joints.
08.05 Check the fluid level in a manual transmission.
08.06 Check the fluid level in a differential.
08.07 Remove and replace transmission mounts.
08.08 Adjust shift linkage.
08.09 Adjust clutches.
08.10 Remove and replace extension housing seals and bushings.
08.11 Rebuild manual transmissions, to include overdrives.
08.12 Remove and replace clutches, release bearings, linkage, and pilot bearings.
08.13 Rebuild clutch master and slave cylinders.
08.14 Remove and replace universal joints.
08.15 Remove and replace speedometer gears and service speedometer cables.
08.16 Remove and replace axle bearings and seals.
08.17 Overhaul integral differentials.
08.18 Overhaul removable differentials.
08.19 Overhaul limited slip differentials.
08.20 Overhaul trans axle assemblies.
08.21 Adjust trans axle shifting controls.

08.22 Inspect, remove, replace, and lubricate front-drive-axle flexible joints.
08.23 Inspect, remove, and replace constant-velocity universal joints.

09.0 DEMONSTRATE PROFICIENCY IN ENGINE REPAIR SERVICE--The student will be able to:

09.01 Perform running compression tests.
09.02 Perform cylinder compression tests.
09.03 Perform cylinder leakage tests.
09.04 Clean engines.
09.05 Determine source(s) of oil/coolant loss.
09.06 Determine source(s) of excess noise.
09.07 Determine cause(s) of over-heating.
09.08 Check the engine oil pressure.
09.09 Remove and replace motor mounts.
09.10 Remove and replace core plugs.
09.11 Inspect, remove, and replace flywheels and ring gears.
09.12 Remove and replace engine assemblies.
09.13 Remove and replace oil pans.
09.14 Remove and replace oil pumps.
09.15 Clean cylinder blocks, oil passages, and pistons.
09.16 Inspect blocks for warpage.
09.17 Measure and inspect engine components for proper tolerances.
09.18 Remove and replace crankshafts, mains, and rod bearings.
09.19 Remove and replace camshafts and bushings.
09.20 Remove and replace pistons and rings.
09.21 Remove ridges and deglaze cylinder walls.
09.22 Remove and replace front and rear oil seals.
09.23 Remove and replace intake and exhaust manifolds.
09.24 Remove, clean, inspect and replace cylinder heads; and inspect head for cracks and warpage.
09.25 Test and replace hydraulic lifters.
09.26 Reface valves and seats.
09.27 Check valve guides for wear.
09.28 Remove and replace timing chains and gears.
09.29 Test valve springs.
09.30 Adjust valve lifters.
09.31 Replace rocker-arm assemblies.
09.32 Change oil and oil filters.

10.0 DEMONSTRATE PROFICIENCY IN MANAGEMENT SKILLS--The student will be able to:

10.01 Write and process work orders.
10.02 Process parts warranties and labor claims.
10.03 Process merchandise returns.
10.04 Accept and return cores/cards for rebuilt and exchange items.
10.05 Select and care for shop materials.
10.06 Use supervisory techniques for hiring and firing.
10.07 Prepare technical reports.
10.08 Perform business and technical computations.
10.09 Evaluate productivity.
10.10 Develop a customer relations plan.
10.11 Plan service facilities.
10.12 Schedule production.
10.13 Plan, organize, activate, and control a service operation.
10.14 Perform auto safety inspections.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other employees.

11.07 Identify and adopt acceptable work habits.
11.08 Demonstrate knowledge of how to take job changes appropriately.
11.09 Demonstrate acceptable employee health habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Automotive Service Technology

CODE NUMBER: Secondary ____________ Postsecondary AER0991

Florida CIP IN15.080300

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ________

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

_______ Postsecondary Vocational x Other 13-15

CERTIFICATION COVERAGE: AUTO MECH 7 AUTO IND @ 7 TECH MECH @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as automobile mechanics (620.261-010), engine repair specialist (620.261-010), automatic transmission specialist (620.261-062), transmission and rear axle specialist (620.281-062) front end specialist (620.281-038), brake specialist (620.281-026) electrical system specialist (825.281-022), engine tune-up specialist (620.281-066), heating and air conditioning specialist (620.281-010) automobile service station attendant (620.261-030), new and used car get ready mechanic (806.361-026), automotive electronics specialist (828.281-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The program provides instruction in diagnosis of malfunctions in the repair of engines, fuel, electrical, cooling and brake systems; drive train and suspension systems; and radiators, transmission and carburetors.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, basic management concepts, troubleshooting skills, and servicing, maintaining, and repairing all mechanical systems or gasoline and diesel powered automobiles including fuel, electrical, cooling, brake drive, suspension and related systems.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in theory, fundamentals, service, and rebuilding of the following areas: engine repair, automatic and manual transmissions, drive trains, steering, suspension brakes, electrical systems, engine systems performance, and automotive accessories. The tools, equipment, materials, and processes used in the laboratory should be equal to those used in the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction is utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The typical length of this program for the average achieving student is 2160 hours.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

IV. INTENDED OUTCOMES: After successfully completing this program, the individual will be able to:

01.0 Demonstrate basic knowledge of automotive mechanics.
02.0 Apply electrical and electronic skills in diagnosing/troubleshooting malfunctions of electrical/electronic components
03.0 Demonstrate proficiency in servicing steering, suspension, & wheel systems.
04.0 Demonstrate proficiency in automotive brake service
05.0 Demonstrate proficiency in servicing cooling, air-conditioning & heating systems.
06.0 Demonstrate proficiency in engine performance service.
07.0 Demonstrate proficiency in automatic transmission/trans-axle service.
08.0 Demonstrate proficiency in servicing manual drive trains & axles.
09.0 Demonstrate proficiency in engine repair service.
10.0 Demonstrate proficiency in management skills
11.0 Demonstrate employability skills.
12.0 Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial SECONDARY NUMBER

PROGRAM TITLE: Automotive Service Technology PROGRAM NUMBER: AER0991

01.0 DEMONSTRATE BASIC KNOWLEDGE OF AUTOMOTIVE MECHANICS--The student will be able to:

01.01 Apply shop safety rules and procedures.

01.02 Use and maintain hand tools such as screwdrivers, special-application pliers, hammers, chisels, punches, special-application wrenches and sockets, files, hacksaws, bench vises, and c-clamps.

01.03 Demonstrate use of precision measuring tools.

01.04 Apply electrical safety rules and procedures.

01.05 Apply fire safety rules and procedures.

01.06 Apply basic welding skills related to the automobile industry.

01.07 Use and maintain power tools such as drills, bench grinders, drill presses, hydraulic presses, impact wrenches, air chisels, parts washers, hydraulic jacks, and vehicle hoists.

01.08 Use and apply basic electrical and electronic test equipment and meters.

01.09 Use and install fasteners such as screws and bolts, key screw. extractors, helicoil inserts, and thread cutting taps and dies.

01.10 Apply basic math skills.

01.11 Apply metric math skills.

01.12 Lubricate and service chassis.

01.13 Demonstrate use of multiple- and single volume type shop manuals.

01.14 Demonstrate use of specification handbooks and tuneup charts.

01.15 Demonstrate use of Motors, Chilton, Mitchell and other service manuals.

01.16 Understand electrical terms, magnetism, electrical current flow and Ohms' law, and sources.

01.17 Understand and apply the rules of series circuits.

01.18 Understand and apply the rules of parallel circuits.

01.19 Understand and apply the rules of series-parallel circuits.

01.20 Understand steering geometry and suspension geometry such as caster, camber, toe-in, kingpin inclination (steering axis), and toe-in and toe-out on turns.

01.21 Understand the function of steering and suspension system components such as coil springs, leaf springs, torsion bars, twin "I" beams, quadralink, rubber bushings, shock absorbers, tie rods, ball joints, shackles, idler arm, pitman arm, and control arm.

01.22 Understand manual and power steering operation--integral and linkage types--such as power steering pump, power steering control valve, and power steering fluid leaks.

01.23 Understand drum brake operation such as adjusters, wheel cylinder, pull, grab, chatter, noise, pulsations, fade, and lining conditions.

01.24 Understand disc brake operation such as caliper, piston, pull, grab, chatter, pulsations, fade, and lining conditions.

01.25 Understand brake system valve operation such as pressure. differential valve, proportional valve, metering valve, and brake warning light.

01.26 Understand pedal height.

01.27 Demonstrate an understanding of basic heating and cooling systems.

01.28 Understand basic air conditioning systems.

01.29 Demonstrate knowledge of engine component functions and driveability.

01.30 Understand basic ignition and fuel systems.

01.31 Understand rear axle operation such as differential action; limited slip mechanisms; floating, non-floating, and semi-floating.

01.32 Understand drive shaft operation, drive shaft construction, and universal joint operation such as single joint, constant velocity, joint working angle, joint phasing, slip joint joint, splined output, and splined drive shaft.

01.33 Understand automatic transmission operation such as fluid coupling, torque converter, plantary gear system, power flow, hydraulic system, lubricant, and cooling.

01.34 Understand clutch operation.

01.35 Understand clutch release mechanisms, to include linkage and hydraulic.

01.36 Understand manual transmission operation such as torque multiplication, power flow, sliding gears, constant mesh gear, synchronizer action, and shift mechanisms.
01.37 Understand overdrive operation.
01.38 Demonstrate knowledge of internal engine components.
01.39 Demonstrate an understanding of advanced electronics concepts.
01.40 Demonstrate an understanding of electronic schematic diagrams and diagnostic techniques.
01.41 Demonstrate an understanding of electrical/electronic wire repair procedures.
01.42 Demonstrate an understanding of electronic semiconductor concepts and components.
01.43 Demonstrate an understanding of electronic transistor concepts and components.
01.44 Demonstrate an understanding of electronic microprocessor concepts, functions, and components.
01.45 Diagnose and correct malfunctions in computer conrol systems.
01.46 Diagnose, test and replace on-board computer controls.
01.47 Diagnose, service and replace computerized sensors.
01.48 Adjust door hinges and striker plates.
01.49 Locate and seal air and water leaks.
01.50 Locate and seal duct leaks.
01.51 Locate and correct rattles and noises.
01.52 Install door holdings.
01.53 Remove and replace window regulators.
01.54 Adjust window regulators.
01.55 Install air shocks.
01.56 Install C.B.'s and radios.
01.57 Touch up paint.
01.58 Lubricate hinges.
01.59 Adjust headlights.
01.60 Inspect and replace passenger restraints.
01.61 Check vehicle visibility.
01.62 Check and adjust specified fluid levels.

02.0 APPLY ELECTRICAL AND ELECTRONIC SKILLS IN DIAGNOSING/TROUBLESHOOTING MALFUNCTIONS OF ELECTRICAL/ELECTRONIC COMPONENTS (Computerized or Non-Computerized)--The student will be able to:

02.01 Diagnose engine malfunctions.
02.02 Perform power checks with test lights.
02.03 Perform continuity tests.
02.04 Measure voltage drop, current flow, and resistance in a circuit or component with a multimeter.
02.05 Locate an open circuit or a short circuit.
02.06 Analyze cranking system malfunctions.
02.07 Analyze charging system malfunctions.
02.08 Service and test batteries.
02.09 Remove and replace light bulbs.
02.10 Inspect, remove, and replace alternator belts.
02.11 Test, remove, and replace fuses and circuit breakers.
02.12 Replace and test starters.
02.13 Overhaul starters.
02.14 Test and overhaul alternators.
02.15 Remove and replace regulators.
02.16 Inspect and repair lighting systems.
02.17 Diagnose, repair or replace turn signal and stoplight switches.
02.18 Test and replace electrical system switches.
02.19 Diagnose, repair, or replace power window and power seat systems, including motors.
02.20 Diagnose, repair, or replace horn systems.
02.21 Diagnose, repair or replace clock systems.
02.22 Diagnose, repair, or replace warning buzzer and seat belt interlock systems.
02.23 Test and replace instrument panel units.
02.24 Service windshield wiper/washer systems.
02.25 Service cruise control systems.
02.26 Test and replace units.
02.27 Check, remove, and replace radios.

03.0 DEMONSTRATE PROFICIENCY IN STEERING, SUSPENSION, and WHEEL SERVICES--The student will be able to:

03.01 Diagnose abnormal tire wear problems.
03.02 Diagnose suspension problems.
03.03 Diagnose wheel/tire vibrations, shimmy, and tramp.
03.04 Diagnose steering problems.
03.05 Lubricate suspension, steering gear, and linkage.
03.06 Check manual steering gear fluid level.
03.07 Inspect steering systems.
03.08 Inspect suspension systems.
03.09 Inspect and test shock absorbers.
03.10 Check power steering fluid level.
03.11 Replace power steering drive belts.
03.12 Identify tires by types and sizes.
03.13 Inspect and service tires and wheels.
03.14 Repair tires.
03.15 Rotate wheels and tires.
03.16 Bubble balance wheels and tires.
03.17 Spin balance wheels and tires.
03.18 Service front wheel bearings and grease seals.
03.19 Remove and replace front wheel bearings.
03.20 Remove and replace spindles and ball joints.
03.21 Remove and replace shock absorbers and mountings.
03.22 Rebuild MacPherson-type struts.
03.23 Measure and adjust torsion bar height.
03.24 Remove and replace coil springs/torsion bars.
03.25 Remove and replace control arms and bushings.
03.26 Remove and replace steering linkage components.
03.27 Remove and replace steering dampers.
03.28 Remove and replace rear suspension parts.
03.29 Remove, replace, and repair steering assemblies.
03.30 Overhaul recirculating ball manual gears.
03.31 Overhaul rack and pinion manual gears.
03.32 Remove and replace power steering pumps.
03.33 Overhaul power steering pumps.
03.34 Overhaul integral power steering gears.
03.35 Overhaul rack and pinion power steering gears.
03.36 Overhaul linkage-type power- steering gears.
03.37 Check 2-wheel and 4-wheel alignment.

04.0 DEMONSTRATE PROFICIENCY IN AUTOMOTIVE BRAKE SERVICE--The student will be able to:

04.01 Diagnose brake system problems.
04.02 Diagnose pressure differential valve malfunctions.
04.03 Diagnose proportioning valve malfunctions.
04.04 Diagnose metering valve malfunctions.
04.05 Check master cylinder fluid level.
04.06 Perform operational inspections.
04.07 Inspect brake and wheel assemblies.
04.08 Remove and replace calipers and rotors.
04.09 Refinish rotors.
04.10 Refinish calipers.
04.11 Refinish brake drums.
04.12 Replace drum brake shoes.
04.13 Adjust brake shoes.
04.14 Adjust parking brakes.
04.15 Rebuild wheel cylinders.
04.16 Remove and replace wheel cylinders.
04.17 Bleed hydraulic brakes.
04.18 Free up or replace parking brake cables and linkage.
04.19 Remove and replace master cylinders.
04.20 Remove and replace hydraulic power cylinders.
04.21 Flush brake systems.
04.22 Service and repair power assist and brake control systems.
04.23 Service and repair front and rear disc brakes.
04.24 Replace hydraulic brake boosters.

05.0 DEMONSTRATE PROFICIENCY IN COOLING, AIR CONDITIONING, and HEATING SERVICE--The student will be able to:

05.01 Inspect, remove, and replace fan belts.
05.02 Check radiator coolant level.
05.03 Test and replace coolant.
05.04 Pressure test cooling systems.
05.05 Test radiator caps.
05.06 Inspect, remove, and replace radiator and heater hoses.
05.07 Remove, test, and replace thermostats.
05.08 Flush cooling systems.
05.09 Remove and replace radiators.
05.10 Remove and replace water pumps.
05.11 Diagnose basic air conditioning system problems.
05.12 Inspect and pressure test basic air conditioning systems.
05.13 Inspect, remove, and replace air conditioning belts.
05.14 Discharge, evacuate, and charge basic air conditioning systems.
05.15 Leak test basic air conditioning systems.
05.16 Service air conditioning electrical circuits.
05.17 Service vacuum circuits.
05.18 Remove and replace components in basic air conditioning systems.
05.19 Remove and replace engine fan clutches.
05.20 Service import air conditioning systems.
05.21 Remove and replace blower motors.
05.22 Remove and replace heater cores, control units, and cables.

06.0 DEMONSTRATE PROFICIENCY IN ENGINE PERFORMANCE SERVICE--The student will be able to:

06.01 Analyze engine performance.
06.02 Perform running cylinder balance tests.
06.03 Perform cylinder compression tests.
06.04 Check the performance of engines equipped with on-board computers.
06.05 Inspect, remove, and replace points and condensers.
06.06 Remove and replace distributors.
06.07 Check distributors using a distributor tester.
06.08 Check the distributor advance in a vehicle.
06.09 Overhaul distributors.
06.10 Inspect and test primary circuits.
06.11 Remove and replace coils.
06.12 Remove and replace ignition switches and resistors.
06.13 Inspect, remove, and replace ignition wires, caps, and rotors.
06.14 Remove and replace spark plugs.
06.15 Clean and gap spark plugs.
06.16 Perform cylinder leakage tests.
06.17 Service import electronic ignition systems.
06.18 Service GM high energy ignition systems.
06.19 Diagnose GM Computer Command Control (CCC) systems.
06.20 Service Chrysler electronic ignitions.
06.21 Service Chrysler oxygen feedback systems.
06.22 Service Ford solid state ignitions.
06.23 Service Ford EEC/MCU systems.
06.24 Service air cleaners.
06.25 Inspect, remove, and replace fuel filters.
06.26 Measure fuel flow and pressure.
06.27 Remove and replace fuel lines.
06.28 Remove and replace fuel pumps.
06.29 Adjust idle speed.
06.30 Adjust idle mixture: propane.
06.31 Clean and adjust chokes.
06.32 Clean and overhaul carburetors.
06.33 Inspect, remove, and replace manifold control valves.
06.34 Remove and replace turbochargers.
06.35 Check and adjust waste gates.
06.36 Remove and replace fuel injection system filters.
06.37 Set idle speed to specifications.
06.38 Remove and replace fuel injectors.
06.39 Service throttle body fuel injection systems.
06.40 Service ported fuel injection systems.
06.41 Service PCV systems.
06.42 Service evaporative control systems.
06.43 Service thermostatic air cleaners.

06.44 Service air injection systems.
06.45 Inspect, remove, and replace air-pump belts.
06.46 Service EGR systems.
06.47 Service ignition timing controls.
06.48 Test exhaust emissions using an HC/CO tester.
06.49 Remove and replace catalytic converter beads.
06.50 Service diesel injectors.
06.51 Remove and replace diesel engine fuel filters.
06.52 Check and adjust injection pump timing.
06.53 Remove and replace injection pumps.
06.54 Check and adjust idle and maximum speeds.
06.55 Test and service pre-heating systems.
06.56 Diagnose mechanical, ignition, and fuel emission problems.
06.57 Inspect exhaust systems.
06.58 Remove and replace tail pipes.
06.59 Remove and replace mufflers.
06.60 Remove and replace exhaust pipes.
06.61 Inspect, remove, and replace catalytic converters.

07.0 DEMONSTRATE PROFICIENCY IN AUTOMATIC TRANSMISSION/TRANS-AXLE SERVICE--The student will be able to:

07.01 Check automatic transmission fluid level.
07.02 Performance test automatic transmissions.
07.03 Diagnose malfunctions of automatic transmissions such as fluid leaks, fluid condition, slipping, lock-up, and shift problems.
07.04 Diagnose, repair, and replace trans-axles.
07.05 Pressure test transmissions in vehicles.
07.06 Stall test transmissions in vehicles.
07.07 Change transmission oil and filter.
07.08 Adjust linkage from the engine.
07.09 Adjust shift linkage.
07.10 Test the electrical controls of an automatic clutch converter.
07.11 Adjust neutral safety switches.
07.12 Remove and replace external gaskets and seals.
07.13 Test vacuum shift modulators.
07.14 Adjust bands.
07.15 Service governors.
07.16 Service valve bodies.
07.17 Rebuild transmission assemblies.
07.18 Pressure flush converter assemblies.
07.19 Pressure flush transmission cooler assemblies.
07.20 Remove and replace extension housings and bushings.

08.0 DEMONSTRATE PROFICIENCY IN SERVICING MANUAL DRIVE TRAINS & AXLES--The student will be able to:

08.01 Diagnose drive line problems.
08.02 Diagnose and performance test manual transmission problems.
08.03 Inspect drive shafts, U-joints, and center bearings.
08.04 Lubricate universal joints.
08.05 Check the fluid level in a manual transmission.
08.06 Check the fluid level in a differential.
08.07 Remove and replace transmission mounts.
08.08 Adjust shift linkage.
08.09 Adjust clutches.
08.10 Remove and replace extension housing seals and bushings.
08.11 Rebuild manual transmissions, to include overdrives.
08.12 Remove and replace clutches, release bearings, linkage, and pilot bearings.
08.13 Rebuild clutch master and slave cylinders.
08.14 Remove and replace universal joints.
08.15 Remove and replace speedometer gears and service speedometer cables.
08.16 Remove and replace axle bearings and seals.
08.17 Overhaul integral differentials.
08.18 Overhaul removable differentials.
08.19 Overhaul limited slip differentials.
08.20 Overhaul trans-axle assemblies.
08.21 Adjust trans-axle shifting controls.

08.22 Inspect, remove, replace, and lubricate front-drive-axle flexible joints.
08.23 Inspect, remove, and replace constant velocity universal joints.

09.0 DEMONSTRATE PROFICIENCY IN ENGINE REPAIR SERVICE--The student will be able to:

09.01 Perform running compression tests.
09.02 Perform cylinder compression tests.
09.03 Perform cylinder leakage tests.
09.04 Clean engines.
09.05 Determine source(s) of oil/coolant loss.
09.06 Determine source(s) of excess noise.
09.07 Determine cause(s) of over heating.
09.08 Check the engine oil pressure.
09.09 Remove and replace motor mounts.
09.10 Remove and replace core plugs.
09.11 Inspect, remove, and replace flywheels and ring gears.
09.12 Remove and replace engine assemblies.
09.13 Remove and replace oil pans.
09.14 Remove and replace oil pumps.
09.15 Clean cylinder blocks, oil passages, and pistons.
09.16 Inspect blocks for warpage.
09.17 Measure and inspect engine components for proper tolerances.
09.18 Remove and replace crankshafts, mains, and rod bearings.
09.19 Remove and replace camshafts and bushings.
09.20 Remove and replace pistons and rings.
09.21 Remove ridges and deglaze cylinder walls.
09.22 Remove and replace front and rear oil seals.
09.23 Remove and replace intake and exhaust manifolds.
09.24 Remove, clean, inspect and replace cylinder heads; and inspect head for cracks and warpage.
09.25 Test and replace hydraulic lifters.
09.26 Reface valves and seats.
09.27 Check valve guides for wear.
09.28 Remove and replace timing chains and gears.
09.29 Test valve springs.
09.30 Adjust valve lifters.
09.31 Replace rocker-arm assemblies.
09.32 Change oil and oil filters.

10.0 DEMONSTRATE PROFICIENCY IN MANAGEMENT SKILLS--The student will be able to:

10.01 Write and process work orders.
10.02 Process parts warranties and labor claims.
10.03 Process merchandise returns.
10.04 Accept and return cores/cards for rebuilt and exchange items.
10.05 Select and care for shop materials.
10.06 Use supervisory techniques for hiring and firing.
10.07 Prepare technical reports.
10.08 Perform business and technical computations.
10.09 Evaluate productivity.
10.10 Develop a customer relations plan.
10.11 Plan service facilities.
10.12 Schedule production.
10.13 Plan, organize, activate, and control a service operation.
10.14 Perform auto safety inspections.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other employees.

11.07 Identify and adopt acceptable work habits.
11.08 Demonstrate knowledge of how to take job changes appropriately.
11.09 Demonstrate acceptable employee health habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Automotive Upholstery and Trim

CODE NUMBER: Secondary ______ Postsecondary UPH0151

Florida CIP IN48.030301

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-17

CERTIFICATION COVERAGE: AUTO UPH 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as auto seat cover, top installers (50080600), springers (50144603), upholsterers (50144605), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, operating sewing machine, installing carpeting and lining, upholstering door panels, arm rests, seats and accessories, installing headliners and accessories, fitting tonneau covers, installing convertible and vinyl tops, customizing vehicles and performing shop management functions.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in sewing, design and layout, using shop and cutting tools, fabricating and installing seat covers, trim and tops, and sales consultant skills.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply basic upholstery and trim skills.
02. Install automotive carpet.
03. Install trunk lining.
04. Re-upholster door panels and arm rests.
05. Remove and install headliners and accessories.
06. Repair, repad, and re-upholster dashboards.
07. Re-upholster seats.
08. Fabricate and fit tonneau covers.
09. Remove and install convertible top.

10. Remove and install vinyl/landau tops.
11. Customize vehicles.
12. Perform business management skills.
13. Demonstrate employability skills.
14. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
SECONDARY NUMBER: __________
PROGRAM TITLE: Automotive Upholstery and Trim
POSTSECONDARY NUMBER: UPH0151

01.0 APPLY BASIC UPHOLSTERY AND TRIM SKILLS--The student will be able to:

01.01 Apply communication and leadership techniques.
01.02 Apply human relations skills.
01.03 Identify safety procedures
01.04 Apply measuring skills.
01.05 Identify shop tools and equipment.
01.06 Identify shop supplies and hardware.
01.07 Identify procedures for operating walking foot machine.
01.08 Apply basic sewing techniques.
01.09 Apply advanced sewing techniques.
01.10 Select design and type of fabric.
01.11 Perform detailing skills.

02.0 INSTALL AUTOMOTIVE CARPET--The student will be able to:

02.01 Select carpet.
02.02 Install carpet in automobiles/trucks.
02.03 Install carpet in vans.
02.04 Install carpet in imported/sports cars.

03.0 INSTALL TRUCK LINING--The student will be able to:

03.01 Install truck lining.
03.02 Install truck carpet.

04.0 REUPHOLSTER DOOR PANELS AND ARM REST--The student will be able to:

04.01 Remove door panels.
04.02 Reupholster arm rest.
04.03 Identify door panels and accessories.
04.04 Upholsters door panels.
04.05 Install door panels.

05.0 REMOVE AND INSTALL HEADLINERS AND ACCESSORIES--The student will be able to:

05.01 Remove headliners and accessories.
05.02 Install molded headliners and accessories.

06.0 REPAIR, REPAD AND REUPHOLSTER DASHBOARD--The student will be able to:

06.01 Repair dashboard.
06.02 Repad dashboard.
06.03 Reupholster dashboard.

07.0 REUPHOLSTER SEATS--The student will be able to:

07.01 Remove seat unit.
07.02 Repair frame unit.
07.03 Reupholster seat.
07.04 Reupholster head rest.
07.05 Install seats.
07.06 Install seats in sports cars.
07.07 Install backrest trim.
07.08 Install seats with backrest.
07.09 Install ready-made seat covers.

08.0 FABRICATE AND FIT TONNEAU COVERS--The student will be able to:

08.01 Select tonneau covering.
08.02 Fabricate tonneau covers.
08.03 Fit tonneau covers.

09.0 REMOVE AND INSTALL CONVERTIBLE TOP--The student will be able to:

09.01 Select convertible top.
09.02 Remove convertible top.
09.03 Install convertible top.
09.04 Install rear window unit.

09.05 Fabricate and install convertible well.
09.06 Install top pad.
09.07 Fabricate and install convertible boot.

10.0 REMOVE AND INSTALL VINYL/LANDAU TOPS--The student will be able to:

10.01 Identify types of vinyl/landau installations.
10.02 Select vinyl/landau top covers.
10.03 Remove vinyl/landau top.
10.04 Install vinyl/landau top.

11.0 CUSTOMIZING VEHICLES--The student will be able to:

11.01 Customize seats.
11.02 Customize carpet.
11.03 Customize headliner.
11.04 Customize panel.
11.05 Customize dashboard.
11.06 Customize package tray.
11.07 Customize convertible top and accessories.
11.08 Customize exterior.
11.09 Customize car cover.
11.10 Customize tire covers.
11.11 Customize miscellaneous body parts.
11.12 Install sun/T-top.

12.0 PERFORMING BUSINESS MANAGEMENT FUNCTIONS--The student will be able to:

12.01 Perform sales consulting duties.
12.02 Estimate job costs.
12.03 Perform business practices.
12.04 Use sample fabric/material books.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

13.01 Conduct a job search.
13.02 Secure information about a job.
13.03 Identify documents which may be required when applying for a job interview.
13.04 Complete a job application form correctly.
13.05 Demonstrate competence in job interview techniques.
13.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
13.07 Identify acceptable work habits.
13.08 Demonstrate knowledge of how to make job changes appropriately.
13.09 Demonstrate acceptable employee health habits.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship.
14.02 Describe the importance of entrepreneurship to the American economy.
14.03 List the advantages and disadvantages of business ownership.
14.04 Identify the risks involved in ownership of a business.
14.05 Identify the necessary personal characteristics of a successful entrepreneur.
14.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Aviation Administration

CODE NUMBER: Secondary ______ Postsecondary AVM0010

Florida CIP IN49.010400

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ______7-9 ______9-12 ______Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-15

CERTIFICATION COVERAGE: AVN ADM 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment with occupational titles as air station managers (184.167-082), or to provide supplemental training for persons previously or currently employed in these occupations.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, technical writing, records management, security, Federal Aviation Administration regulations, data processing, and air cargo transportation.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the development and reinforcement of skills in human relations, facility management and air cargo and passenger management.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 12.0, Language 12.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1600 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate understanding of safe and efficient work practices.
02. Demonstrate understanding of Federal Aviation Administration, state and other governmental laws, rules and policies.
03. Demonstrate understanding of personal management.
04. Demonstrate understanding of business law and management pertaining to aeronautics.
05. Demonstrate understanding of aviation safety and accident prevention and investigation.
06. Prepare, analyze and evaluate technical reports and data.
07. Demonstrate understanding of federal and state security procedures.
08. Maintain personnel records and budgets.

09. Evaluate facility maintenance problems and prescribe corrective action.
10. Demonstrate employability skills.
11. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Aviation Administration POSTSECONDARY NUMBER: AVM0010

01.0 DEMONSTRATE AN UNDERSTANDING OF SAFE AND EFFICIENT WORK PRACTICES--The student will be able to:

01.01 Demonstrate an awareness and understanding of health and safety hazards, prevention and correction of ecological problems and know the solutions unique to the industry.
01.02 Demonstrate an awareness and understanding of fueling hazards.
01.03 Demonstrate an awareness and understanding of physical hazards.
01.04 Demonstrate an awareness and understanding of fire hazards.
01.05 Demonstrate an awareness of and the ability to control and extinguish fires.
01.06 Demonstrate an awareness and understanding for the need of safety devices, controls, guards and equipment.
01.07 Demonstrate awareness, understanding and use of personal safety devices such as goggles, masks, helmets, hearing protectors, air respirators and protective clothing.

02.0 DEMONSTRATE UNDERSTANDING OF FEDERAL AVIATION ADMINISTRATION, STATE AND OTHER GOVERNMENTAL LAWS, RULES AND POLICIES--The student will be able to:

02.01 Describe the economic, social and political importance of commercial aviation, general aviation and aircraft manufacturing in the United States.
02.02 Describe the function, basic organization and responsibility of the National Transportation Safety Board.
02.03 Explain major portions of Parts 1, 61, 67, 91 and 830 of the Federal Aviation Regulations.
02.04 List and describe the federal statutes pertaining to the economic regulation of the airline industry.
02.05 List and describe the major federal statutes pertaining to the regulation of aviation safety.
02.06 Describe the historical and current relationship between the U.S. Post Office and the aviation industry.
02.07 List and describe six categories of general aviation.
02.08 Describe the development of aviation laws and their anology to the Law of the Sea.
02.09 Explain the Department of Transportation, State of Florida, and its structure as relates to the aircraft industry.

03.0 DEMONSTRATE UNDERSTANDING OF PERSONNEL MANAGEMENT--The student will be able to:

03.01 Name and describe the basic guides in personnel management.
03.02 Discuss governmental relations in personnel management.
03.03 Explain the general nature of personnel problem, and approaches to problem solving.
03.04 State the general nature of job and personnel requirements; and technical and managerial employee requirements.
03.05 Tell the importance and scope of education; and the role of communication and the fundamental rules of communication.
03.06 Discuss the significance of remuneration and its problems; both economic and non-economic.
03.07 Describe training and education aspects of company programs.
03.08 State the role and purpose of interviewing and counseling.

04.0 DEMONSTRATE UNDERSTANDING OF BUSINESS LAW AND MANAGEMENT PERTAINING TO AERONAUTICS--The student will be able to:

04.01 Describe and identify in what manner and under what conditions an aviation company may expose itself to a lawsuit.
04.02 Discuss the fundamental aspects of several categories of law that may affect the company because of its activities.
04.03 State the fundamental principles of torts, contracts, bailments, labor, agency, negligence, administrative, product liability, partnerships, and corporations.
04.04 Explain how an employee's action or inaction may subject the aviation company to a law suit involving one or more of the several categories of law.

05.0 DEMONSTRATE UNDERSTANDING OF AVIATION SAFETY AND ACCIDENT PREVENTION AND INVESTIGATION--The student will be able to:

05.01 Describe and explain the complete regulation that is still exercised by the Federal government in the field of safety, and investigation.
05.02 State and discuss the portion of the Federal Aviation Act of 1958 as amended, which is generally described as Title VI, safety Regulations of Civil Aeronautics.
05.03 Tell the minimum standards governing design, materials workmanship, performance of aircraft, inspection, servicing, overhaul of aircraft, and parts and appliances, equipment and facilities, as required by Section 601 (a) of Federal Aviation Act of 1958 Section 601 (a).
05.04 Discuss the maximum hours of service for airmen and other employees, and other practices, methods, and procedures as required by Section 601 (a) of the Federal Aviation Act of 1958.
05.05 Explain the Federal Aviation Regulations (FAR's) promulgated by the Administrator to implement the authority granted by the Federal Aviation Act of 1958, in the area of safety, and to prevent accidents.

06.0 PREPARE, ANALYZE AND EVALUATE TECHNICAL REPORTS AND DATA--The student will be able to:

06.01 State the five basic guidelines for preparation of technical reports.
06.02 Compare the difference between technical and literary description.
06.03 Describe the techniques used in technical report writing.
06.04 Discuss the arrangement of the technical written report--such as cause and effect, inductive and deductive, enumeration and classification, problems and solution.
06.05 Explain the preparatory work or stages in the process such as the writing, the drafts, use of the library, and polish style.
06.06 Tell types of reports, and describe use of illustrations.
06.07 Discuss the steps in developing an oral presentation.

07.0 DEMONSTRATE UNDERSTANDING OF FEDERAL AND STATE SECURITY PROCEDURES--The student will be able to:

07.01 Describe passenger security systems in use.
07.02 Describe and define federal security laws.
07.03 Identify local law enforcement agencies.
07.04 List known security risk features.
07.05 Describe cargo theft precautions in use at facility.
07.06 Describe the International Air Transport Association.
07.07 List the more common labels found in the "Restricted Articles Regulations" as published in bulletins by IATA.

08.0 MAINTAIN PERSONNEL RECORDS AND BUDGETS--The student will be able to:

08.01 State the scope of selection procedures.
08.02 Describe the nature of the information gathered about candidates.
08.03 Explain the process of interpreting the findings and making of decisions.
08.04 Tell the nature of the necessary reports and records of candidates rejected, and candidates accepted.
08.05 State the objectives of the personnel program as related to the overall objectives of the company, whether the company provides a service or a product.
08.06 Discuss the specific goals sought and tasks to be undertaken by the personnel department, such as the number of people to be hired, types of personnel, grievance or bargaining sessions, anticipated worker accidents or illnesses.
08.07 State the staff necessary to attain goals; and equipment and resources they will require.
08.08 Explain how the requirements to attain the stated company goals will necessitate the allocation of the stated budget in order to implement the requisite program.

09.0 EVALUATE FACILITY MAINTENANCE PROBLEMS AND PRESCRIBE CORRECTIVE ACTION--The student will be able to:

09.01 Describe and explain the complete regulation that is still exercised by the Federal government in the field of safety, and maintenance.
09.02 Tell the minimum standard for work practices including methods and procedures as required by Section 601 (a) of the Federal Aviation Act of 1958.
09.03 Explain the Federal Aviation Regulations (FAR's) promulgated by the Administrator to implement the authority granted by the Federal Aviation Act of 1958.
09.04 State the procedures and practices in conformity with the FAR's when FAA inspectors review the company practices.

10.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

10.01 Conduct a job search.
10.02 Secure information about a job.
10.03 Identify documents which may be required when applying for a job interview.
10.04 Complete a job application form correctly.
10.05 Demonstrate competence in job interview techniques.
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
10.07 Identify acceptable work habits.
10.08 Demonstrate knowledge of how to make job changes appropriately.
10.09 Demonstrate acceptable employee health habits.

11.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

11.01 Define entrepreneurship.
11.02 Describe the importance of entrepreneurship to the American economy.
11.03 List the advantages and disadvantages of business ownership.
11.04 Identify the risks involved in ownership of a business.
11.05 Identify the necessary personal characteristics of a successful entrepreneur.
11.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Aviation Quality Control

CODE NUMBER: Secondary ______ Postsecondary ATM0540

Florida CIP IN48.999901

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-15

CERTIFICATION COVERAGE: TEC MECH @ 7 TEC METAL @ 7 AIR MECH 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as engineering technicians other (10081898), precision assemblers (706.681-010), quality control technicians (012.261-014), or to provide supplemental training for persons previously or currently employed in these occupations.

In the first year, Dimensional Metrology, the purpose is to help the learner develop skills in the use of close tolerances measurements; to develop attitudes of patience, persistence and cleanliness in the use of all types of measuring equipment. In the second year, Nondestructive Testing, the purpose is to have the learner develop the knowledge and ability to correctly and safely use penetrant materials, magnetic particle materials and equipment, radiographic materials and equipment, and ultrasonic and eddy current equipment to industry levels of competence as outlined in ASNT-TC-1A.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, the use of blueprints and diagrams, engineering specifications, nondestructive reliability testing, material characteristics, component inspection and evaluation, electromechanics, electronic test equipment, assembly and repair of mechanical components, and use of current industry standards, practices and techniques.

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a classroom/laboratory setting using lecture, discussion, audio-visual presentations and demonstration. Hands-on experiences are a major portion of the available time, utilizing the instruments and equipment appropriate to the program content and in accordance with current procedures in industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 900 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Explain different systems of measurement.
02. Measure with graduated scales.
03. Demonstrate proficiency with scaled instruments.
04. Demonstrate proficiency with vernier instruments.
05. Demonstrate techniques of using the surface plate.
06. Demonstrate proficiency in the use of micrometers.
07. Demonstrate the use of gauge blades.
08. Demonstrate proper utilization of dial indicators.
09. Calibrate different types of measuring instruments.
10. Demonstrate use of optical flats as measurement instruments.
11. Demonstrate use of various high amplification instruments.
12. Demonstrate different techniques in determining angle measurements.
13. Explain processing of metal from ore and inherent discontinuities.
14. Demonstrate visual inspection with various equipment.
15. Demonstrate techniques in the use of liquid penetrants.
16. Demonstrate methods of hardness testing.
17. Demonstrate methods of magnetic particle inspection.
18. Demonstrate techniques of radiographic inspection.
19. Demonstrate techniques of ultrasonic inspection.
20. Demonstrate techniques of eddy current inspection.
21. Demonstrate employability skills.
22. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________
PROGRAM TITLE: Aviation Quality Control POSTSECONDARY NUMBER: ATM0540

01.0 EXPLAIN DIFFERENT SYSTEMS OF MEASUREMENT--The student will be able to:

01.01 Compare the new systems of measurement with the old.
01.02 Differentiate between the fractional and the decimal inch.
01.03 Explain the metric system of measurement.
01.04 Demonstrate how to round up and round down numbers.

02.0 MEASURE WITH GRADUATED SCALES--The student will be able to:

02.01 Read the steel scale.
02.02 Explain discrimination.
02.03 Demonstrate points of reference.
02.04 Demonstrate two kinds of error encountered in reading scales.

03.0 DEMONSTRATE PROFICIENCY WITH SCALED INSTRUMENTS--The student will be able to:

03.01 Use and read the depth gauge.
03.02 Demonstrate the uses of the combination square.
03.03 Demonstrate proper gauging pressure.
03.04 Set up and use surface gauges.

04.0 DEMONSTRATE PROFICIENCY WITH VERNIER INSTRUMENTS--The student will be able to:

04.01 Read a Vernier scale.
04.02 Demonstrate and compare two methods of measurement.
04.03 Set up and demonstrate the techniques of using the Vernier caliper, Vernier depth gauge, and Vernier height gauge.

05.0 DEMONSTRATE TECHNIQUES OF USING THE SURFACE PLATE--The student will be able to:

05.01 Give the definition of a reference plane.
05.02 Identify the different types of surface plates.
05.03 Explain what true flatness is.
05.04 Demonstrate proper safety in handling surface plates and their accessories.

06.0 DEMONSTRATE PROFICIENCY IN THE USE OF MICROMETERS--The student will be able to:

06.01 Recite the principles of measuring with the micrometer.
06.02 Read the micrometer scales.
06.03 Demonstrate the techniques of using the micrometer.
06.04 Adjust and calibrate the micrometer.
06.05 Demonstrate how to care for the micrometer.
06.06 Identify the different types of micrometers.
06.07 Demonstrate the use of telescoping and small hole gauges.

07.0 DEMONSTRATE THE USE OF GAUGE BLADES--The student will be able to:

07.01 Explain the history of gauge blocks and the evolution of standards.
07.02 Demonstrate the techniques of using gauge blocks.
07.03 Perform the operation of combining gauge blocks and using gauge block holders.
07.04 Show proper care in handling gauge blocks.

08.0 DEMONSTRATE PROPER UTILIZATION OF DIAL INDICATORS--The student will be able to:

08.01 Explain what measurement by comparison is.
08.02 Name and demonstrate different methods of amplification.
08.03 Explain the terms sensitivity, resolution and tolerance.
08.04 Demonstrate this knowledge of the selection and use of dial indicators and their accessories.
08.05 Show how to calibrate and care for dial indicators.

09.0 CALIBRATE DIFFERENT TYPES OF MEASURING INSTRUMENTS--The student will be able to:

09.01 Show by demonstration different types of measurement errors.
09.02 Explain interaction of errors.
09.03 Calibrate micrometers, Vernier calipers, and dial indicators.

10.0 DEMONSTRATE USE OF OPTICAL FLATS AS MEASURING INSTRUMENTS--The student will be able to:

10.01 Explain the theory of light waves.
10.02 Identify the equipment used to measure light waves.
10.03 Demonstrate the techniques of setting up the equipment for measuring light waves.
10.04 Read and interpret the results of light wave measurement.
10.05 Demonstrate the application of optical flats for measurement.
10.06 Use proper care in handling optical flats.

11.0 DEMONSTRATE THE USE OF VARIOUS HIGH AMPLIFICATION INSTRUMENTS--The student will be able to:

11.01 Demonstrate the use of electronic mechanical, and optical comparators.
11.02 Explain the ten to one rule.
11.03 Demonstrate a case where temperature affects measurement.
11.04 Perform calibration and adjustments of high amplification instruments and show proper care in handling.

12.0 DEMONSTRATE DIFFERENT TECHNIQUES IN DETERMINING ANGLE MEASUREMENTS--The student will be able to:

12.01 Explain geometric angles and name the parts of a circle.
12.02 Demonstrate the techniques of using precision squares.
12.03 Read and use a bubble lever.
12.04 Operate the bevel protractor.
12.05 Set up and use the sine bar.

13.0 EXPLAIN PROCESSING OF METAL FROM ORE AND INHERENT DISCONTINUTIES--The student will be able to:

13.01 List and define the defects that are inherent in material.
13.02 List and define the defects resulting from processing material.
13.03 List and define the defects occurring in materials in service.

14.0 DEMONSTRATE VISUAL INSPECTION WITH VARIOUS EQUIPMENT--The student will be able to:

14.01 Show the ability to handle high power magnifying glasses.
14.02 Demonstrate the use of microscopes and borescopes.

15.0 DEMONSTRATE TECHNIQUES IN THE USE OF LIQUID PENETRANTS--The student will be able to:

15.01 Explain the theory of liquid penetrant testing.
15.02 Prepare parts and specimens for applying penetrant.
15.03 Demonstrate techniques for applying penetrant.
15.04 Demonstrate techniques of applying developer.
15.05 Interpret indications.
15.06 Explain the advantages and limitations of liquid penetrant testing.
15.07 Discuss safety and work precautions.

16.0 DEMONSTRATE METHODS OF HARDNESS TESTING--The student will be able to:

16.01 Explain the purpose of hardness testing.
16.02 Demonstrate the use of the conductivity tester.
16.03 List and define the mechanical methods of hardness testing.
16.04 Demonstrate the use of the Rockwell Hardness Tester.

17.0 DEMONSTRATE METHODS OF MAGNETIC PARTICLE INSPECTION--The student will be able to:

17.01 Explain the theory of magnetism.
17.02 Define the principles of magnetic particle testing.
17.03 Discuss the equipment used in magnetic particle testing.
17.04 Prepare specimens for testing.

17.05 Demonstrate the techniques of operating magnetic particle testing equipment.
17.06 List the types of particles and techniques of applying these particles.
17.07 Diagnose indications.
17.08 Demonstrate methods of demagnetizing parts.
17.09 Explain and discuss the advantages and limitations of magnetic particle testing.
17.10 Discuss safety and work precautions.

18.0 DEMONSTRATE TECHNIQUES OF RADIOGRAPHIC INSPECTION--The student will be able to:

18.01 Explain the theory and principles of radiography.
18.02 Operate the equipment used in radiographic testing.
18.03 Compare types of film used.
18.04 Prepare a specimen for X-ray.
18.05 Properly expose X-ray film.
18.06 Diagnose the image on the X-ray film.
18.07 Discuss the advantages and limitations of radiographic testing.
18.08 Explain the hazards involved in X-ray work.

19.0 DEMONSTRATE TECHNIQUES OF ULTRASONIC INSPECTION--The student will be able to:

19.01 Explain the theory of sound and sound wave propagation and generation.
19.02 Describe various equipment used in ultrasonic testing.
19.03 Demonstrate the techniques of operating ultrasonic equipment.
19.04 Prepare a specimen for testing.
19.05 Compare different methods of presentation.
19.06 Perform calibration checks using standard reference blocks.
19.07 Interpret indications on the cathode ray tube (A-scan).
19.08 Discuss the advantages and limitations of ultrasonic testing.
19.09 Explain the safety and work precautions in handling ultrasonic equipment.

20.0 DEMONSTRATE THE TECHNIQUES OF EDDY CURRENT INSPECTION--The student will be able to:

20.01 Explain the principles of eddy current testing.
20.02 Read the different types of indicators.
20.03 Define the different types of test coils.
20.04 Prepare a specimen for testing.
20.05 Demonstrate the use of standards for analyzing results.
20.06 Operate eddy current equipment demonstrating proper techniques.
20.07 Interpret indications.
20.08 Discuss the advantages and limitations of eddy current testing.
20.09 Explain the work precautions and safety in handling the equipment.

21.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

21.01 Conduct a job search.
21.02 Secure information about a job.
21.03 Identify documents which may be required when applying for a job interview.
21.04 Complete a job application form correctly.
21.05 Demonstrate competence in job interview techniques.
21.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
21.07 Identify acceptable work habits.
21.08 Demonstrate knowledge of how to make job changes appropriately.
21.09 Demonstrate acceptable employee health habits.

22.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

22.01 Define entrepreneurship.
22.02 Describe the importance of entrepreneurship to the American economy.
22.03 List the advantages and disadvantages of business ownership.
22.04 Identify the risks involved in ownership of a business.
22.05 Identify the necessary personal characteristics of a successful entrepreneur.
22.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Avionics

CODE NUMBER: Secondary ______ Postsecondary ATM0650

Florida CIP IN47.019901

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-17

CERTIFICATION COVERAGE: AVIONICS 7 ELECTRONIC 7 RADIO COMM @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as avionics technicians (823.281-010) or in related occupations in electronics, or to provide supplemental training for persons previously or currently employed in these occupations.

The program prepares individuals to inspect, troubleshoot, repair, and install airborne radio communications, radio navigations, and radar equipment and systems in accordance with regulatory and industry standards.

The content includes, but is not limited to, electronic fundamentals, basics of AM and FM transmitters and receivers, avionics equipment and systems covering radio communication, radio navigation, and radar. Integrated into this content will be communications, leadership, and human relations skills, safe and efficient work practices, use of manufacturers circuit diagrams, schematics, and service instructions, soldering and desoldering techniques, electronic laboratory and repair station practices, regulatory requirements and documentation. The content also includes preparation for passing any licensing/certification tests required by industry or regulation that do not require an experience prerequisite.

II. LABORATORY ACTIVITIES: Electronic laboratory and repair station activities are an integral part of this course. The tools, test equipment, avionics equipment, materials, and processes used in the conduct of the course shall be similar to those used in the avionics industry. Students will be required to use the various types of precision test equipment in use in repair stations throughout the avionics industry for the purpose of analyzing, troubleshooting, and repairing avionics equipment and systems.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

Algebra is recommended as a prerequisite for entry into this program.

This program will assist students to prepare for gainful employment in Federal Aviation Administration certificated radio repair stations as documented in Federal Aviation Regulations Part 145, Appendix A. These radio repair stations are owned by private, commercial, and manufacturing sectors of the industry and are operated in accordance with federal rules and regulations.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 2160 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate entry level skills in DC electronics through problem solving, use of circuit diagrams and schematics, identification and application of components and circuits, and use of tools and test equipment.
02. Demonstrate entry level skills in AC electronics through problem solving, use of circuit diagrams and schematics, identification and application of components and circuits, and use of tools and test equipment.
03. Demonstrate entry level skills in semiconductor and vacuum tube devices through problem solving, use of circuit diagrams and schematics, identification and application of components and circuits, and use of tools and test equipment.
04. Demonstrate entry level skills in analog circuits through problem solving, use of circuit diagrams and schematics, identification and application of components and circuits, use of tools and test equipment, and troubleshooting procedures.
05. Demonstrate entry level skills in soldering and non-destructive desoldering techniques.
06. Demonstrate entry level skills in analysis methodology.
07. Demonstrate entry level skills in digital devices and circuits through problem solving, use of circuit diagrams and schematics, identification and application of components and circuits, use of appropriate tools and test equipment, and troubleshooting procedures.
08. Demonstrate entry level skills in microprocessors through problem solving, use of circuit diagrams and schematics, identification and application of components and circuits, use of tools and test equipment, and troubleshooting procedures.
09. Demonstrate entry level skills in amplitude and frequency modulated transmitters through problem solving, use of circuit diagrams and schematics, identification and application of components and circuits, use of tools and test equipment, and troubleshooting procedures.
10. Demonstrate entry level skills in AM and FM receivers through problem solving, use of circuit diagrams and schematics, identification and application of components and circuits, use of tools and test equipment, and troubleshooting procedures.
11. Demonstrate entry level skills in AM and FM transceivers through problem solving, use of circuit diagrams and schematics, identification and application of components and circuits, use of tools and test equipment, and troubleshooting procedures.
12. Demonstrate entry level skills in electromagnetic wave emissions, wave propagation, antennas, and transmission lines through problem solving, use of diagrams and schematics, identification and application of components and circuits, use of tools and test equipment, and troubleshooting procedures.
13. Demonstrate entry level skills in avionics radio repair station regulations and procedures.
14. Demonstrate entry level skills in aircraft electrical systems and ground safety.
15. Demonstrate entry level skills in line and bench maintenance of airborne communication systems through the use of manufacturer's maintenance and service manuals, system analysis, and application of appropriate tools, test equipment, and troubleshooting procedures.
16. Demonstrate entry level skills in line and bench maintenance of airborne radio navigation systems and equipment through use of manufacturer's maintenance and service manuals, system analysis, application of appropriate tools and test equipment, and troubleshooting procedures.
17. Demonstrate entry level skills in line and bench maintenance of airborne radar systems through the use of manufacturer's maintenance and service manuals, system analysis, application of appropriate tools and test equipment, and troubleshooting procedures.

18. Demonstrate entry level skills in the principles of operation of area navigation (R-NAV) systems
19. Demonstrate entry level skills in the procedures for installation of avionics systems.
20. Demonstrate entry level skills in the calibration of repair station test equipment through the use of manufacturer's manuals, and application of standards and calibration procedures.
21. Demonstrate employability skills.
22. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Avionics POSTSECONDARY NUMBER: ATM0650

01.0 DEMONSTRATE ENTRY LEVEL SKILLS IN DC ELECTRONICS THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF TOOLS AND TEST EQUIPMENT--The student will be able to:

01.01 Solve electronic math problems related to DC circuits including series, parallel, and series-parallel circuits.
01.02 Identify and define electron theory and sources of electrical energy.
01.03 Define the relationship between current, voltage, resistance and power.
01.04 Solve basic electronic problems involving current, voltage, resistance and power.
01.05 Identify and measure resistors.
01.06 Use an analog and digital multimeter to measure current, voltage, resistance, and continuity of passive components.
01.07 Draw, analyze, construct and troubleshoot series circuits.
01.08 Draw, analyze, construct and troubleshoot parallel circuits.
01.09 Draw, analyze, construct and troubleshoot series-parallel circuits.
01.10 Draw, analyze, construct and troubleshoot voltage divider circuits.
01.11 Demonstrate a knowledge of magnetism and electromagnetism.
01.12 Analyze and calculate RL and RC time constants.
01.13 Set up and operate power supplies for DC circuits.
01.14 Set up and operate oscilloscopes for DC circuits.
01.15 Troubleshoot and locate defective components in a functional DC circuit consisting of resistors, relays, lamps, switches, fuses, indicators, rheostats, potentiometers, capacitors, conductors, and power supplies.

02.0 DEMONSTRATE ENTRY LEVEL SKILLS IN AC ELECTRONICS THROUGH PROBLEM SOLVING, USE, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF TOOLS AND TEST EQUIPMENT--The student will be able to:

02.01 Solve electronics math problems related to AC circuits including RC, RL, RLC, LC, AND z for series, parallel and series-parallel circuits.
02.02 Identify properties of an AC sineusoidol waveform.
02.03 Use an analog and digital multimeter to measure current, voltage, resistance, and continuity of passive components.
02.04 Draw, analyze, construct, and troubleshoot AC resistive circuits.
02.05 Draw, analyze, construct, and troubleshoot series, parallel, and series-parallel inductive and resistive-inductive circuits.
02.06 Draw, analyze, construct, and troubleshoot series, parallel, and series-parallel capacitive and resistive-capacitive circuits.
02.07 Draw, analyze, construct, and troubleshoot series, parallel, and capacitive-inductive circuits.
02.08 Draw, analyze, construct, and troubleshoot transformer circuits.
02.09 Draw, analyze, construct, and troubleshoot series, parallel and series-parallel resistive-capacitive-inductive circuits.
02.10 Draw, analyze, construct, and troubleshoot series and parallel resonant circuits.
02.11 Draw, analyze, construct, and troubleshoot low-pass, high-pass, bandpass, and reject filters.
02.12 Analyze basic motor and generator theory and operation.
02.13 Set up and operate power supplies for AC circuits.
02.14 Set up and operate oscilloscopes for AC circuits
02.15 Set up and operate frequency counters for AC circuits.
02.16 Set up and operate signal generators for AC circuits.
02.17 Troubleshoot and locate defective components in a functional AC circuit consisting of resistors, capacitors, inductors, and transformers.

03.0 DEMONSTRATE ENTRY LEVEL SKILLS IN SEMICONDUCTOR AND VACUUM TUBE DEVICES THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF TOOLS AND TEST EQUIPMENT--The student will be able to:

03.01 Identify properties of semiconductor material.

03.02 Analyze and measure characteristics of P-N and vacuum tube diodes.
03.03 Analyze and measure characteristics of special diodes, including tunnel diodes, zener, voltage regulator, and varactor.
03.04 Analyze and measure characteristics of bipolar junction transistors and vacuum tube triodes.
03.05 Analyze and measure characteristics of field effect transistors and multielement vacuum tubes.
03.06 Analyze and measure characteristics of metal oxide semiconductor field effect transistors.
03.07 Analyze and measure characteristics of thyristors.
03.08 Analyze and measure characteristics of optoelectronic devices.
03.09 Analyze and measure characteristics of operational amplifiers.
03.10 Describe integrated circuits and their applications.
03.11 Set up and operate multimeters for solidstate and vacuum tube devices.
03.12 Set up and operate oscilloscopes for solidstate and vacuum tube devices.
03.13 Set up and operate transistor and vacuum tube testers.

04.0 DEMONSTRATE ENTRY LEVEL SKILLS IN ANALOG CIRCUITS THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF TOOLS AND TEST EQUIPMENT, AND TROUBLESHOOTERS PROCEDURES--The student will be able to:

04.01 Draw, analyze, construct, and troubleshoot diode circuits.
04.02 Draw, analyze$, construct, and troubleshoot power supply, regulator, and filter circuits.
04.03. Draw, analyze, construct, and troubleshoot single-stage amplifier circuits.
04.04 Draw, analyze, construct, and troubleshoot multi-stage amplifier circuits.
04.05 Draw, analyze, construct, and troubleshoot oscillator circuits.
04.06 Draw, analyze, construct, and troubleshoot wave-shaping circuits.
04.07 Draw, analyze, construct, and troubleshoot operational amplifier circuits.
04.08 Draw, analyze, construct, and troubleshoot active filter circuits.
04.09 Set up and operate multimeters for analog circuits.
04.10 Set up and operate oscilloscopes for analog circuits.
04.11 Set up and operate frequency counters for analog circuits.
04.12 Set up and operate signal generators for analog circuits.
04.13 Set up and operate transistor testors for analog circuits.

05.0 DEMONSTRATE ENTRY LEVEL SKILLS IN SOLDERING AND NON-DESTRUCTIVE DESOLDERING TECHNIQUES--The student will be able to:

05.01 Select, maintain, and use soldering and desoldering tools.
05.02 Use solders with different tin/lead percentages.
05.03 Solder conductors and components to: turret, cup, befurcated, hooked, pierced terminals and connectors.
05.04 Solder axial lead components to Printed Circuit (PC) boards.
05.05 Remove components and conductors from terminals without damage, including: IC's, TO-5, transistors, diodes, transformers and controls.
05.06 Repair damaged PC board circuitry.

06.0 DEMONSTRATE ENTRY LEVEL SKILLS IN ANALYSIS METHODOLOGY--The student will be able to:

06.01 Analyze circuits using: Kirchoff's Current, and Voltage Laws, Superposition, Thevenin's and Norton's Theorems, "T", "Pi", and Bridge Network.
06.02 Analyze circuits using Wheatstone and LCR Bridge.

07.0 DEMONSTRATE ENTRY LEVEL SKILLS IN DIGITAL DEVICES AND CIRCUITS THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF APPROPRIATE TOOLS AND TEST EQUIPMENT, AND TROUBLESHOOTING PROCEDURES--The student will be able to:

07.01 Identify number systems and solve digital math problems using binary, octal, and hexadecimal radix.
07.02 Identify characteristics of integrated circuit logic families using resistor-transistor logic, diode-transistor logic, transistor-transistor logic, emitter coupled logic, MDS, and C-MOS

07.03 Draw, analyze using truth tables and boolean expressions, and troubleshoot OR/NOR, AND/NAND, and XOR gates.
07.04 Draw, analyze and troubleshoot flif-flops and latch circuits using R-S, D, T, and J-K devices.
07.05 Draw, analyze, and troubleshoot clock and timing circuits.
07.06 Draw, analyze, and troubleshoot registers and counters.
07.07 Draw, analyze, and troubleshoot arithmetic circuits.
07.08 Draw, analyze, and troubleshoot combinal logic circuits.
07.09 Draw, analyze, and troubleshoot encoders and decoders.
07.10 Draw, analyze, and troubleshoot multiplexers and demultiplexers.
07.11 Draw, analyze, and troubleshoot memory circuits.
07.12 Draw, analyze, and troubleshoot analog-to-digital and digital-to-analog circuits.
07.13 Draw, analyze, and troubleshoot display circuits.
07.14 Set up and operate multimeters for digital circuits.
07.15 Set up and operate logic probes and pulsers for digital circuits.
07.16 Set up and operate oscilloscopes for digital circuits.

08.0 DEMONSTRATE ENTRY LEVEL SKILLS IN MICROPROCESSORS THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF TOOKS AND TEST EQUIPMENT, AND TROUBLESHOOTING PROCEDURES--The student will be able to:

08.01 Analyze architecture and functions of a microprossor unit (MPU).
08.02 Analyze theory and operation of a MPU.
08.03 Analyze an instruction set of a MPU.
08.04 Analyze input/output techniques.
08.05 Analyze MPU system hardware.
08.06 Analyze MPU system interface circuits.
08.07 Set up and operate DVM for MPU system measurements.
08.08 Set up and operate logic probes for MPU system measurements.
08.09 Set up and operate oscilloscopes for MPU system measurements.
08.10 Set up and operate frequency counters for MPU system measurements.

09.0 DEMONSTRATE ENTRY SKILLS IN AMPLITUDE AND FREQUENCY MODULATED TRANSMITTERS THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF TOOLS AND TEST EQUIPMENT, AND TROUBLESHOOTING PROCEDURES--The student will be able to:

09.01 Define DSB, SSB and PM modulation.
09.02 Draw, analyze, and troubleshoot A, and FM RF oscillator circuits.
09.03 Draw, analyze, and troubleshoot buffer and multiplier circuits.
09.04 Draw, analyze, and troubleshoot RF power amplifier circuits.
09.05 Draw, analyze, and troubleshoot AM and FM modulation circuits.
09.06 Draw, analyze, and troubleshoot microphone circuits.
09.07 Draw, analyze, and troubleshoot balanced modulators and SSB filter circuits.
09.08 Draw, analyze, and troubleshoot A, and FM power supply circuits.
09.09 Make power, frequency, and modulation measurements of AM and FM transmitters.
09.10 Align and troubleshoot AM and FM transmitters.
09.11 Describe FCC rules pertaining to AM and FM transmitter maintenance and operation.

10.0 DEMONSTRATE ENTRY LEVEL SKILLS IN AM ANF FM RECEIVERS THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF TOOLS AND TEST EQUIPMENT, AND TROUBLESHOOTING PROCEDURES--The student will be able to:

10.01 Draw, analyze, and troubleshoot receiver audio voltage and power amplifiers and speaker/headphone circuits.
10.02 Draw, analyze, and troubleshoot AM and FM detector circuits.
10.03 Draw, analyze, and troubleshoot AM IF amplifier circuits.
10.04 Draw, analyze, and troubleshoot FM IF amplifier and limited circuits.
10.05 Draw, analyze, and troubleshoot receiver oscillator and AFC circuits
10.06 Draw, analyze, and troubleshoot RF mixer/hetrodyne circuits.
10.07 Draw, analyze, and troubleshoot receiver RF amplifier circuits.
10.08 Draw, analyze, and troubleshoot AVC/AGC circuits.
10.09 Draw, analyze, and troubleshoot receiver power supplies.
10.10 Make receiver sensitivity, selectivity, banwidth, image rejection, and adjacent channel rejection measurements.
10.11 Align and troubleshoot AM and FM receivers.

11.0 DEMONSTRATE ENTRY LEVEL SKILLS IN AM AND FM TRANSCEIVERS THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF TOOLS AND TEST EQUIPMENT, AND TROUBLESHOOTING PROCEDURES--The student will be able to:

11.01 Analyze and troubleshoot transceiver control, metering, and switching circuits.
11.02 Analyze and troubleshoot transceiver frequency synthesizers and phase locked loop circuits.
11.03 Analyze and troubleshoot squelch circuits.
11.04 Align and troubleshoot transceivers.

12.0 DEMONSTRATE ENTRY LEVEL SKILLS IN ELECTROMAGNETIC WAVE EMISSIONS, WAVE PROPAGATION, ANTENNAS, AND TRANSMISSION LINES THROUGH PROBLEM SOLVING, USE OF DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF TOOLS AND TEST EQUIPMENT, AND TROUBLESHOOTING PROCEDURES--The student will be able to:

12.01 Define the radio frequency sprectrum.
12.02 Define types and classification of RF emissions.
12.03 Define the characteristics of radio waves.
12.04 Define radio wave propagation method.
12.05 Define the basic types of antennas.
12.06 Draw the voltage and current relationships and radiation patterns for the basic types of antennas.
12.07 Solve signal strength problems and measure signal strength.
12.08 Solve problems pertaining to antenna length, propagation velocity, and frequency.
12.09 Define methods for antenna tuning, gain, and directivity.
12.10 Define transmission lines in terms of electrical and physical properties.
12.11 Define standing saves, cause and effect, and measure standing wave ratios.
12.12 Define tuned transmission lines and describe applications.
12.13 Draw voltage, current, and impedance relationships for tuned transmission lines.
12.14 Compute transmission line losses.
12.15 Construct transmission lines.
12.16 Define waveguides, resonant cavities and their applications.

13.0 DEMONSTRATE ENTRY LEVEL SKILLS IN AVIONICS RADIO REPAIR STATION REGULATIONS AND PROCEDURES--The student will be able to:

13.01 Define repair station related regulatory and standardization agencies and their purposes.
13.02 Define repair station certification requirements.
13.03 Define requirements for certification of radio repairman.
13.04 Practice proper station operation procedures.
13.05 Prepare repair station reports and documentation.

14.0 DEMONSTRATION ENTRY LEVEL SKILLS IN AIRCRAFT ELECTRICAL SYSTEMS AND GROUND SAFETY--The student will be able to:

14.01 Define standard aircraft bus voltage.
14.02 Analyze aircraft electrical power generation and charging systems.
14.03 Analyze aircraft electrical power control and distribution systems.
14.04 Analyze aircraft electrical warning systems.
14.05 Analyze aircraft ignition systems.
14.06 Describe and practice aircraft ground handling safety procedures pertaining to avionics maintenance.

15.0 DEMONSTRATE ENTRY LEVEL SKILLS IN LINE AND BENCH MAINTENANCE OF AIRBORNE COMMUNICATION SYSTEMS THROUGH THE USE OF MANUFACTURER'S MAINTENANCE AND SERVICE MANUALS, SYSTEM ANALYSIS, APPLICATION OF APPROPRIATE TOOLS, TEST EQUIPMENT, AND TROUBLESHOOTING PROCEDURES--The student will be able to:

15.01 Describe theory of operation of air to ground communication systems.
15.02 Determine serviceability through performance checks of avionics communication systems.
15.03 Troubleshoot to the component/module level malfunctioning communication systems/equipment.
15.04 Repair and return to service air to ground communication systems/equipment.

15.05 Analyze and troubleshoot communication transmitter switching and audio distribution circuits and equipment.
15.06 Describe the theory of operation of emergency locator transmitters. (ELTs)
15.07 Perform preventive and regulatory maintenance and performance tests on ELTs.
15.08 Troubleshoot defective ELTs, repair, and return to service.

16.0 DEMONSTRATE ENTRY LEVEL SKILLS IN LINE AND BENCH MAINTENANCE OF AIRBORNE RADIO NAVIGATION SYSTEMS AND EQUIPMENT THROUGH USE OF MANUFACTURER'S MAINTENANCE AND SERVICE MANUALS, SYSTEM ANALYSIS, APPLICATION OF APPROPRIATE TOOLS AND TEST EQUIPMENT, AND TROUBLESHOOTING PROCEDURES--The student will be able to:

16.01 Describe the principles and theory of operation of VHF omnirange receivers, converters, and indicators.
16.02 Determine through performance checks, the serviceability of VHF omnirange systems.
16.03 Troubleshoot to the component/module level malfunctioning omnirange systems.
16.04 Repair and return to service omnirange systems equipment.
16.05 Describe the principles and theory of operation of instrument landing systems (ILS).
16.06 Determine through performance checks the serviceability of localizer, glideslope, and marker beacon receivers, converters, and indicators.
16.07 Troubleshoot to the component/module level malfunctioning ILS systems and equipment.
16.08 Repair and return to service ILS systems and equipment.
16.09 Describe the principles of operation of microwave landing systems.
16.10 Describe the principles and theory of operation of Automatic Direction Finders (ADF).
16.11 Determine through performance checks the serviceability of ADF systems.
16.12 Troubleshoot to the component/module level malfunctioning ADF systems.
16.13 Repair and return to service ADF systems.
16.14 Describe radio navigation systems/equipment interface with other aircraft instruments and systems.

17.0 DEMONSTRATE ENTRY LEVEL SKILLS IN LINE AND BENCH MAINTENANCE OF AIRBORNE RADAR SYSTEMS THROUGH THE USE OF MANUFACTURER'S MAINTENANCE AND SERVICE MANUALS, SYSTEMS, SYSTEM ANALYSIS, APPLICATION OF APPROPRIATE TOOLS AND TEST EQUIPMENT, AND TROUBLESHOOTING PROCEDURES--The student will be able to:

17.01 Describe the principles and theory of operation of Air Traffic Control (ATC) transponders and altitude encoders.
17.02 Determine through performance checks the serviceability of ATC transponders and altitude encoders.
17.03 Troubleshoot to the component/module level ATC transponders.
17.04 Repair and return to service ATC transponders.
17.05 Describe the principles and theory of operation and Distance Measurements Equipment (DME).
17.06 Determine through performance checks the serviceability of DME systems.
17.07 Troubleshoot to the component/module level malfunctioning DME systems.
17.08 Repair and return to service DME systems.
17.09 Describe the principles and basic theory of operation of weather radar systems.
17.10 Describe the basic principles of operation of the 3M/RYAN Stormscope.

18.0 DEMONSTRATE ENTRY LEVEL SKILLS IN THE PRINCIPLES OF OPERATION OF AREA NAVIGATION (R-NAV) SYSTEMS--The student will be able to:

18.01 Describe the principles of operation of VHF R-Nav systems (VOR-DME).
18.02 Describe the principles of operation of hyperbolic R-Nav systems. (Loran C) (Omega/VAF)

19.0 DEMONSTRATE ENTRY LEVEL SKILLS IN THE PROCEDURES FOR INSTALLATION OF AVOINICS SYSTEMS--The student will be able to:

19.01 Draw an interconnecting diagram and interconnect an IFR Avionics system for a single engine or light twin aircraft using acceptable methods, techniques, and practices.
19.02 Determine proper placement of the various antennas required for an IFR Avionics package on a light twin or single engine aircraft.
19.03 Describe the effects of precipitation static on aircraft radios and standard methods of reduction.
19.04 Compute the dimensions of an ADF Sense antenna for a typical installation.
19.05 Apply the formula for weight and balance computation.

20.0 DEMONSTRATE ENTRY LEVEL SKILLS IN THE CALIBRATION OF REPAIR STATION TEST EQUIPMENT THROUGH THE USE OF MANUFACTURER'S MANUALS, AND APPLICATION OF STANDARDS AND CALIBRATION PROCEDURES--The student will be able to:

20.01 Describe the regulatory requirements for repair station test equipment calibration.
20.02 Calibrate frequency counters/meters.
20.03 Calibrate general purpose multimeters.
20.04 Calibrate RF voltmeters.
20.05 Calibrate RF powermeters, wattmeters, loads, and attenuators.
20.06 Calibrate audio signal generators and power meters.
20.07 Calibrate oscilloscopes.
20.08 Calibrate power supplies.
20.09 Calibrate RF signal generators.
20.10 Calibrate special purpose test sets normally used in an Avionics Repair Station.

21.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

21.01 Conduct a job search.
21.02 Secure information about a job.
21.03 Identify documents which may be required when applying for a job interview.
21.04 Complete a job application form correctly.
21.05 Demonstrate competence in job interview techniques.
21.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
21.07 Identify acceptable work habits.
21.08 Demonstrate knowledge of how to make job changes appropriately.
21.09 Demonstrate acceptable employee health habits.

22.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

22.01 Define entrepreneurship.
22.02 Describe the importance of entrepreneurship to the American economy.
22.03 List the advantages and disadvantages of business ownership.
22.04 Identify the risks involved in ownership of a business.
22.05 Identify the necessary personal characteristics of a successful entrepreneur.
22.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Barbering

CODE NUMBER: Secondary 8757100 Postsecondary COS0995

Florida CIP IN12.040200

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 10-12, 13-15, 21

CERTIFICATION COVERAGE: BARBERING 7 PERS SERV @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare a person for employment as barbers (70081000) or to provide supplemental training for persons previously or currently employed in this occupation. Instruction is designed to qualify students for employment and upon successfully passing the Florida Barber License Examination.

The contest includes, but is not limited to, communication skills, leadership skills, human relations skills and employability skills, safe and efficient work practices; Florida barber law and rules, acquisition of knowledge of barber and its related chemistry, bacteriology, anatomy and physiology; development of skill in performing the manipulative technique required in the practice of barbering.

Listed below are the courses that comprise this program when offered at the secondary level:

8757110	Barbering 1
8757120	Barbering 2
8757130	Barbering 3
8757140	Barbering 4
8757150	Barbering 5
8757160	Barbering 6
8757170	Barbering 7
8757180	Barbering 8

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on experience with tools and chemicals appropriate to the program content and in accordance with current practices in the trade, and includes cutting, shampooing and styling hair, and shaving with special attention to hygiene, skin and scalp disease, and equipment sterilization.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The length of this program is 1200 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate safe and efficient work practices.
02. Identify and perform shampooing and conditioning of hair.
03. Identify and perform trimming, shaping hair using clippers, shears and razors.
04. Identify and perform hair styles.
05. Identify and perform straightening of hair.

Barbering - Continued

06. Identify and perform permanent waving of hair.
07. Identify and prepare hair pieces and wigs.
08. Identify and perform hair coloring.
09. Identify and perform mustache and beard styling.
10. Demonstrate shaving the face.
11. Perform face, neck and scalp massage.
12. Perform facial treatments.
13. Develop barber management skills.
14. Demonstrate employability skills.
15. Demonstrate knowledge of state board requirements.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8757100
PROGRAM TITLE: Barbering POSTSECONDARY NUMBER: COS0995

01.0 DEMONSTRATE SAFE AND EFFICIENT WORK PRACTICES--The student will be able to:

01.01 Observe and apply sanitation and shop safety rules and practices to all skill procedures.
01.02 Set up and operate equipment and materials.
01.03 Clean and maintain personal tools and equipment.
01.04 Demonstrate professional ethics with customers and co-workers.

02.0 IDENTIFY AND PERFORM SHAMPOOING AND CONDITIONING OF HAIR--The student will be able to:

02.01 Prepare the patron.
02.02 Diagnose and recognize hair and scalp condition.
02.03 Select appropriate shampoo products.
02.04 Apply shampoo and manipulate to cleanse hair and scalp.
02.05 Rinse shampoo from hair and scalp.
02.06 Select appropriate conditioner.
02.07 Apply conditioners and rinse (if necessary).
02.08 Towel-blot the hair.

03.0 IDENTIFY AND PERFORM TRIMMING, SHAPING HAIR USING CLIPPERS, SHEARS AND RAZORS--The student will be able to:

03.01 Prepare the patron.
03.02 Determine customer desires and needs (basic/style).
03.03 Select proper hair-cutting implements (scissors, razors, thinning shears).
03.04 Section hair and cut guidelines.
03.05 Proceed with desired hair cut.
03.06 Check completed hair cut.

04.0 IDENTIFY AND PERFORM HAIR STYLES--The student will be able to:

04.01 Prepare the patron and determine desired style.
04.02 Prepare and perform wet set using principles of design (finger waves, pin curls, or rollers).
04.03 Prepare and perform heat styling using either blow dryers, curling irons, straightening combs, pressing irons, or electric rollers.
04.04 Comb into style.

05.0 IDENTIFY AND PERFORM STRAIGHTENING OF HAIR--The student will be able to:

05.01 Prepare the patron and analyze hair.
05.02 Select appropriate chemical materials and follow manufacturing directions.
05.03 Section and apply chemicals.
05.04 Test for desired results.
05.05 Rinse, shampoo and style the hair.

06.0 IDENTIFY AND PERFORM PERMANENT WAVING OF HAIR--The student will be able to:

06.01 Prepare the patron and analyze hair.
06.02 Determine customer desires and needs.
06.03 Select appropriate perm solutions and rod size and follow manufacturer instructions.
06.04 Perform pre-permanent shampoo and shaping.
06.05 Section and wrap hair properly.
06.06 Apply protective cream or lotion; apply cotton to hairline.
06.07 Apply perm solution and process; take test curls.
06.08 Rinse, blot, and neutralize; rinse again.
06.09 Remove rods, condition, and style; record results.

07.0 IDENTIFY AND PREPARE HAIR PIECES AND WIGS--The student will be able to:

07.01 Determine and identify styles and colors of wigs and hair pieces.
07.02 Measure the head and fit wig or hair piece.
07.03 Clean, shape, and style to patron's features.

08.0 IDENTIFY AND PERFORM HAIR COLORING--The student will be able to:

08.01 Prepare tint.
08.02 Apply selected tint for retouch or virgin hair.
08.03 Process, rinse, and shampoo.
08.04 Condition, if needed.
08.05 Style; record results.

09.0 IDENTIFY AND PERFORM MUSTACHE AND BEARD STYLING--The student will be able to:

09.01 Prepare the patron.
09.02 Identify the design suitable mustache and/or beard style of the nose and face.
09.03 Perform the procedure for trimming a mustache or trimming a beard.
09.04 Remove clipped beard from face and neck.

10.0 DEMONSTRATE SHAVING THE FACE--The student will be able to:

10.01 Prepare patron for shaving.
10.02 Perform the shaving of the patron's face.
10.03 Perform the final cleansing of face and neck.

11.0 PERFORM FACE, NECK AND SCALP MASSAGE--The student will be able to:

11.01 Prepare the patron.
11.02 Diagnose and identify skin condition.
11.03 Cleanse face and neck.
11.04 Perform massage.
11.05 Perform final cleansing.

12.0 PERFORM FACIAL TREATMENTS--The student will be able to:

12.01 Prepare the patron.
12.02 Diagnose and identify skin condition.
12.03 Assemble supplies and equipment.
12.04 Cleanse face and neck.
12.05 Perform designated treatment (mechanical or manual).
12.06 Perform final cleansing of face and neck.

13.0 DEMONSTRATE BARBER MANAGEMENT SKILLS--The student will be able to:

13.01 Assist employees in setting personal goals.
13.02 Set shop goals and organize salon.
13.03 Develop operating budget.
13.04 Select workable site/location for salon.
13.05 Design physical layout and equipment list for salon (within budget limitations).
13.06 Prepare and implement marketing and advertising plan.
13.07 Prepare and implement sales plan.
13.08 Develop and maintain an appropriate accounting system.
13.09 Comply with state and local laws, rules, and regulations.
13.10 Develop an adequate insurance coverage plan.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.

15.0 DEMONSTRATE KNOWLEDGE OF STATE BOARD REQUIREMENTS--The student will be able to:

15.01 Complete Florida's State Board license examination.
15.02 Display Florida's Barbering License.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Barbering PROGRAM NUMBER: 8757100

COURSE TITLE: Barbering 1 COURSE NUMBER: 8757110

COURSE DESCRIPTION:

This course is designed to provide instruction in safety rules and procedures, school, classroom/laboratory procedures. It provides competencies in hair shampooing and conditioning, trimming and shaping hair using clippers, shears and razors.

01.0 DEMONSTRATE SAFE AND EFFICIENT WORK PRACTICES--The student will be able to:

01.01 Observe and apply sanitation and shop safety rules and practices to all skill procedures.
01.02 Set up and operate equipment and materials.
01.03 Clean and maintain personal tools and equipment.
01.04 Demonstrate professional ethics with customers and co-workers.

02.0 IDENTIFY AND PERFORM SHAMPOOING AND CONDITIONING OF HAIR--The student will be able to:

02.01 Prepare the patron.
02.02 Diagnose and recognize hair and scalp condition.
02.03 Select appropriate shampoo products.
02.04 Apply shampoo and manipulate to cleanse hair and scalp.
02.05 Rinse shampoo from hair and scalp.
02.06 Select appropriate conditioner.
02.07 Apply conditioners and rinse (if necessary).
02.08 Towel-blot the hair.

03.0 IDENTIFY AND PERFORM TRIMMING, SHAPING HAIR USING CLIPPERS, SHEARS AND RAZORS--The student will be able to:

03.01 Prepare the patron.
03.02 Determine customer desires and needs (basic/style).
03.03 Select proper hair-cutting implements (scissors, razors, thinning shears).
03.04 Section hair and cut guidelines.
03.05 Proceed with desired hair cut.
03.06 Check completed hair cut.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Barbering PROGRAM NUMBER: 8757100

COURSE TITLE: Barbering 2 COURSE NUMBER: 8757120

COURSE DESCRIPTION:

This course is designed to provide competencies in hair styling and hair straightening.

04.0 IDENTIFY AND PERFORM HAIR STYLES--The student will be able to:

04.01 Prepare the patron and determine desired style.
04.02 Prepare and perform wet set using principles of design (finger waves, pin curls, or rollers).
04.03 Prepare and perform heat styling using either blow dryers, curling. irons, straightening combs, pressing irons, or electric rollers.
04.04 Comb into style.

05.0 IDENTIFY AND PERFORM STRAIGHTENING OF HAIR--The student will be able to:

05.01 Prepare the patron and analyze hair.
05.02 Select appropriate chemical materials and follow manufacturing directions.

05.03 Section and apply chemicals.
05.04 Test for desired results.
05.05 Rinse, shampoo and style the hair.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Barbering

PROGRAM NUMBER: 8757100

COURSE TITLE: Barbering 3

COURSE NUMBER: 8757130

COURSE DESCRIPTION:

This course is designed to provide competencies in permanent waving of hair and preparation and styling of hair pieces and wigs.

06.0 IDENTIFY AND PERFORM PERMANENT WAVING OF HAIR--The student will be able to:

06.01 Prepare the patron and analyze hair.
06.02 Determine customer desires and needs.
06.03 Select appropriate perm solutions and rod size and follow manufacturer instructions.
06.04 Perform pre-permanent shampoo and shaping.
06.05 Section and wrap hair properly.
06.06 Apply protective cream or lotion; apply cotton to hairline.
06.07 Apply perm solution and process; take test curls.
06.08 Rinse, blot, and neutralize; rinse again.
06.09 Remove rods, condition, and style; record results.

07.0 IDENTIFY AND PREPARE HAIR PIECES AND WIGS--The student will be able to:

07.01 Determine and identify styles and colors of wigs and hair pieces.
07.02 Measure the head and fit wig or hair piece.
07.03 Clean, shape, and style to patron's features.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Barbering

PROGRAM NUMBER: 8757100

COURSE TITLE: Barbering 4

COURSE NUMBER: 8757140

COURSE DESCRIPTION:

This course is designed to provide competencies in all phases of hair coloring.

08.0 IDENTIFY AND PERFORM HAIR COLORING--The student will be able to:

08.01 Prepare tint.
08.02 Apply selected tint for retouch or virgin hair.
08.03 Process, rinse, and shampoo.
08.04 Condition, if needed.
08.05 Style; record results.

STUDENT PERFORMANCE STANDARDS   EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education   COURSE CREDIT: 1
PROGRAM TITLE: Barbering   PROGRAM NUMBER: 8757100
COURSE TITLE: Barbering 5   COURSE NUMBER: 8757150

COURSE DESCRIPTION:

This course is designed to provide the student with an opportunity to develop competencies in mustache and beard styling.

09.0 IDENTIFY AND PERFORM MUSTACHE AND BEARD STYLING--The student will be able to:

09.01 Prepare the patron.
09.02 Identify the design suitable mustache and/or beard style of the nose and face.
09.03 Perform the procedure for trimming a mustache or trimming a beard.
09.04 Remove clipped beard from face and neck.

STUDENT PERFORMANCE STANDARDS   EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education   COURSE CREDIT: 1
PROGRAM TITLE: Barbering   PROGRAM NUMBER: 8757100
COURSE TITLE: Barbering 6   COURSE NUMBER: 8757160

COURSE DESCRIPTION:

This course is designed to provide the student with an opportunity to develop competencies in shaving the face and face, neck and scalp massage and facial treatments.

10.0 DEMONSTRATE SHAVING THE FACE--The student will be able to:

10.01 Prepare patron for shaving.
10.02 Perform the shaving of the patron's face.
10.03 Perform the final cleansing of face and neck.

11.0 PERFORM FACE, NECK AND SCALP MASSAGE--The student will be able to:

11.01 Prepare the patron.
11.02 Diagnose and identify skin condition.
11.03 Cleanse face and neck.
11.04 Perform massage.
11.05 Perform final cleansing.

12.0 PERFORM FACIAL TREATMENTS--The student will be able to:

12.01 Prepare the patron.
12.02 Diagnose and identify skin condition.
12.03 Assemble supplies and equipment.
12.04 Cleanse face and neck.
12.05 Perform designated treatment (mechanical or manual).
12.06 Perform final cleansing of face and neck.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Barbering PROGRAM NUMBER: 8757100

COURSE TITLE: Barbering 7 COURSE NUMBER: 8757170

COURSE DESCRIPTION:

This course is designed to provide the student with an opportunity to develop competencies in barber management skills.

13.0 DEMONSTRATE BARBER MANAGEMENT SKILLS--The student will be able to:

13.01 Assist employees in setting personal goals.
13.02 Set shop goals and organize salon.
13.03 Develop operating budget.
13.04 Select workable site/location for salon.
13.05 Design physical layout and equipment list for salon (within budget limitations).
13.06 Prepare and implement marketing and advertising plan.
13.07 Prepare and implement sales plan.
13.08 Develop and maintain an appropriate accounting system.
13.09 Comply with state and local laws, rules, and regulations.
13.10 Develop an adequate insurance coverage plan.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Barbering PROGRAM NUMBER: 8757100

COURSE TITLE: Barbering 8 COURSE NUMBER: 8757180

COURSE DESCRIPTION:

This course is designed to provide the student with an opportunity to develop competencies in employability skills and the study of the barbering law and rules. The student will be knowledgeable of the requirements of the state board examination.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.

15.0 DEMONSTRATE KNOWLEDGE OF STATE BOARD REQUIREMENTS--The student will be able to:

15.01 Complete Florida's State Board license examination.
15.02 Display Florida's Barbering License.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK   PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION   EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Barge and Boat Operation

CODE NUMBER: Secondary 8751100   Postsecondary MTE0997

Florida CIF IN49.030200

SECONDARY SCHOOL CREDITS 6   COLLEGE CREDITS ______   POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 10-12, 13-17, 21

CERTIFICATION COVERAGE: SEAMANSHIP 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as ship engineers (50144026), oilers (61084000), able seamen (61084802), ordinary seamen (61084803), ship mates (197.133-022), tugboat mates (197.133-034), barge captains (911.137-010), deck engineers (623.281-010), boatswains (911.131-010), deck hands (911.687.022), or to provide supplemental training for persons previously or currently employed in these occupations.

The plan of instruction prepares individuals for crew duties on fresh water and seagoing boats, barges and ships. Included are boat navigation, operation, maintenance, loading and unloading, and emergency procedures.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level:

8751110	Barge and Boat Operation 1
8751120	Barge and Boat Operation 2
8751130	Barge and Boat Operation 3
8751140	Barge and Boat Operation 4
8751150	Barge and Boat Operation 5
8751160	Barge and Boat Operation 6

II. LABORATORY ACTIVITIES: Laboratory and onboard activities are an integral part of this program and provide instruction in the safe and efficient operation of commercial watercraft and related systems. Emphasis is placed on vessel operation. Vehicle towing duties may be taught as a local option.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 900 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Dock a vessel.
02. Undock and get vessel underway.
03. Operate vessel at sea.
04. Maneuver around offshore structures.
05. Anchor vessel.
06. Manage and perform cargo handling duties.
07. Bring vessel into port.
08. Perform crew operational and maintenance duties aboard vessel in port.
09. Prepare meals aboard vessel.
10. Plan and perform emergency procedures.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS   EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education   SECONDARY NUMBER: 8751100
PROGRAM TITLE: Barge and Boat Operation   POSTSECONDARY NUMBER: MTE0997

01.0 DOCK A VESSEL--The student will be able to:

01.01 Assign crew members' positions for mooring vessel.
01.02 Cast off vessel's mooring lines while remaining on dock.
01.03 Cast off vessel's mooring lines while remaining aboard vessel.
01.04 Maneuver vessel to dock.
01.05 Release towing gear aboard towing vessel and barges.
01.06 Secure mooring lines to dock.
01.07 Secure mooring lines to vessel.
01.08 Secure engine room.
01.09 Secure a propeller shaft.

02.0 UNDOCK AND GET VESSEL UNDERWAY--The student will be able to:

02.01 Bleed air compressor of water.
02.02 Check and maintain batteries.
02.03 Measure fuel in day tank.
02.04 Maintain proper level of coolant in expansion tank.
02.05 Determine if all navigation lights are functioning.
02.06 Tighten engine mounts.
02.07 Inspect water level indicators for cleanliness.
02.08 Test marine radio equipment.
02.09 Inspect antenna for physical damage.
02.10 Determine if hydraulic steering equipment is free of air and water.
02.11 Inspect fire-fighting equipment for excessive wear, proper location, and prescribed type.
02.12 Inspect buoyant apparatus for excessive wear, proper location, and prescribed type.
02.13 Determine that rudder stuffing box is functioning properly.
02.14 Tighten propeller stuffing box.
02.15 Inspect vessel for fuel leakage.
02.16 Prepare list of equipment to be checked for oil leakage.
02.17 Determine if proper voltage is being generated.
02.18 Maneuver vessel from berth into navigable waterway.
02.19 Pump out bilges.
02.20 Secure loose deck equipment.
02.21 Secure watertight doors, hatches, vents, and skylights.

03.0 OPERATE VESSEL AT SEA--The student will be able to:

03.01 Act as vessel's lookout.
03.02 Determine if electrical connections and outlets are tight and dry.
03.03 Determine if electrical outlets have proper voltage.
03.04 Change air filters on engines.
03.05 Change oil in engines.
03.06 Change oil and fuel filters on engines.
03.07 Chip and paint vessel.
03.08 Clean engine room and its equipment.
03.09 Determine time of arrival when current effect is known.
03.10 Determine time of arrival when current effect is unknown.
03.11 Display day or night signals for different towing situations.
03.12 Inspect heaving lines, mooring lines, and fixed and running rigging for excessive wear.
03.13 Determine greenwich mean time (GMT) by using bessel's chronometer.
03.14 Determine position by using omega navigation system.
03.15 Steer a course by using the magnetic compass.
03.16 Determine "distance off" by using angular measurements.
03.17 Establish a vessel's dead reckoning (DR) track.
03.18 Determine position by means of celestial navigation.
03.19 Plot position by using loran and loran overprint charts.
03.20 Set sea watches.

04.0 MANEUVER AROUND OFFSHORE STRUCTURES--The student will be able to:

04.01 Assist personnel in boarding personnel basket.
04.02 Maneuver vessel to discharge passengers.
04.03 Maneuver vessel to discharge cargo.
04.04 Secure hoses on board vessel.
04.05 Secure lashings, hausers, or mooring lines on board vessel.

05.0 ANCHOR VESSEL--The student will be able to:

05.01 Anchor vessel.
05.02 Maneuver vessel to anchorage area.
05.03 Anchor vessel by using anchor winch.
05.04 Anchor vessel by using anchor windlass.
05.05 Stack (tier) anchor chain in chain locker.

06.0 MANAGE AND PERFORM CARGO HANDLING DUTIES--The student will be able to:

06.01 Adjust vessel's mooring lines to allow for variations of tide and current.
06.02 Determine if all cargo is aboard.
06.03 Determine if all deck cargo is secured.
06.04 Determine if vessel is loaded in compliance with stability laws.
06.05 Discharge cargo by using bulk cargo system.
06.06 Load cargo by using bulk cargo system.
06.07 Prepare list of lost or damaged cargo.

07.0 BRING VESSEL INTO PORT--The student will be able to:

07.01 Determine approximate position and hazardous bottom conditions by using pathometer.
07.02 Determine position by using radio direction finder (RDF).
07.03 Inspect engine room equipment for proper maintenance and safety.
07.04 Determine vessel's course and position against dead reconing plots.
07.05 Correct noutical chart prior to departure.
07.06 Prepare vessel to take on fuel and lube oil.
07.07 Prepare to take on water aboard vessel.

08.0 PERFORM CREW OPERATIONAL AND MAINTENANCE DUTIES ABOARD VESSEL IN PORT--The student will be able to:

08.01 Arrange for dry docking vessel.
08.02 Change brushes in auxiliary engines.
08.03 Change lube oil filters on auxiliary engines.
08.04 Change fuel filters on auxiliary engines.
08.05 Determine if motor bearings are excessively warn.
08.06 Clean electric motor.
08.07 Prepare list of hoses, valves, connections, gaskets, and tanks needing repairs.
08.08 Determine if const-a-voltage regulator is functioning properly.
08.09 Determine if drive belts on air compressors are excessively loose.
08.10 Tighten panel box fittings to prevent vibration.
08.11 Clean keel cool strainers.
08.12 Clean oil coolers.
08.13 Clean oil strainers in marine gears.
08.14 Drain water out of fuel traps.
08.15 Tighten fuel and oil line connections on engines.
08.16 Inspect day tanks containing fuel for leaks.
08.17 Lubricate deck and engine room equipment on a regular schedule.
08.18 Determine vessel's manning requirements.
08.19 Splice eye into line.
08.20 Wash down vessel's superstructure and decks.

09.0 PREPARE MEALS ABOARD VESSEL--The student will be able to:

09.01 Make yeast breads, biscuits, and cornbread.
09.02 Make pie crust.
09.03 Make cream filling for pie.
09.04 Make pancakes.
09.05 Make cakes.
09.06 Cook vegetables by boiling, simmering, and steaming.
09.07 Cook meat, fish, and fowl by broiling.
09.08 Cook meat, seafood, and fowl by braising.
09.09 Cook meat, fish, and fowl by roasting or baking.
09.10 Season and bread meat, seafood, and fowl for baking, roasting, broiling, and frying.
09.11 Cook eggs by frying and scrambling.
09.12 Make gravies.
09.13 Make coffee.
09.14 Make salads.
09.15 Prepare soup stock.

09.16 Prepare sandwiches.
09.17 Prepare dehydrated or concentrated foods.
09.18 Make soup with stock, meats, vegetables, and seasonings, as required by recipe.
09.19 Carve cooled meat.
09.20 Cut trim, and bone beef, lamb, pork, or fish into prescribed portions for steaks, chops, and fillets.
09.21 Clean and care for equipment.
09.22 Order food.
09.23 Plan menus.
09.24 Keep records for purchasing foods.
09.25 Store food.
09.26 Keep continuous inventory of food items.

10.0 PLAN AND PERFORM EMERGENCY PROCEDURES--The student will be able to:

10.01 Act as lookout to keep person in sight who has been lost overboard.
10.02 Administer first aid to prevent shock.
10.03 Administer first aid to control bleeding.
10.04 Administer CPR.
10.05 Launch lifeboat and life raft.
10.06 Close emergency fuel shutoff valves.
10.07 Extinguish class C fire.
10.08 Manuever life raft or lifeboat away from vessel.
10.09 Manuever vessel to return to area in which person was lost overboard.
10.10 Issue life preservers for use by passengers and crew.
10.11 Secure engine room to prevent spread of fire.
10.12 Send out distress signals.
10.13 Sound abandon - ship alarm.
10.14 Train crew to perform emergency procedures.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Barge and Boat Operation — PROGRAM NUMBER: 8751100

COURSE TITLE: Barge and Boat Operation 1 — COURSE NUMBER: 8751110

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for mooring a vessel, the securing of a vessel, and the related duties of inspecting, testing and securing equipment, all related safety rules and procedures performed before getting a vessel underway.

01.0 DOCK A VESSEL--The student will be able to:

01.01 Assign crew members' positions for mooring vessel.
01.02 Cast off vessel's mooring lines while remaining on dock.
01.03 Cast off vessel's mooring lines while remaining aboard vessel.
01.04 Maneuver vessel to dock.
01.05 Release towing gear aboard towing vessel and barges.
01.06 Secure mooring lines to dock.
01.07 Secure mooring lines to vessel.
01.08 Secure engine room.
01.09 Secure a propeller shaft.

02.0 UNDOCK AND GET VESSEL UNDERWAY--The student will be able to:

02.01 Bleed air compressor of water.
02.02 Check and maintain batteries.
02.03 Measure fuel in day tank.
02.04 Maintain proper level of coolant in expansion tank.
02.05 Determine if all navigation lights are functioning.
02.06 Tighten engine mounts.
02.07 Inspect water level indicators for cleanliness.
02.08 Test marine radio equipment.
02.09 Inspect antenna for physical damage.
02.10 Determine if hydraulic steering equipment is free of air and water.
02.11 Inspect fire-fighting equipment for excessive wear, proper location, and prescribed type.
02.12 Inspect buoyant apparatus for excessive wear, proper location, and prescribed type.
02.13 Determine that rudder stuffing box is functioning properly.
02.14 Tighten propeller stuffing box.
02.15 Inspect vessel for fuel leakage.
02.16 Prepare list of equipment to be checked for oil leakage.
02.17 Determine if proper voltage is being generated.
02.18 Maneuver vessel from berth into navigable waterway.
02.19 Pump out bilges.
02.20 Secure loose deck equipment.
02.21 Secure watertight doors, hatches, vents, and skylights.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Barge and Boat Operation — PROGRAM NUMBER: 8751100

COURSE TITLE: Barge and Boat Operation 2 — COURSE NUMBER: 8751120

COURSE DESCRIPTION:

This course is designed to provide instruction of all duties performed while a vessel is at sea. The inspection of electrical systems, preventative maintenance of all engines, vessel lines and rigging, the determination of position, and arrival time, the safe assistance in boarding and discharging of personnel, passengers and cargo, and the safe securing of all lashing, hausers, lines and rigging.

03.0 OPERATE VESSEL AT SEA--The student will be able to:

03.01 Act as vessel's lookout.
03.02 Determine if electrical connections and outlets are tight and dry.

03.03 Determine if electrical outlets have proper voltage.
03.04 Change air filters on engines.
03.05 Change oil in engines.
03.06 Change oil and fuel filters on engines.
03.07 Chip and paint vessel.
03.08 Clean engine room and its equipment.
03.09 Determine time of arrival when current effect is known.
03.10 Determine time of arrival when current effect is unknown.
03.11 Display day or night signals for different towing situations.
03.12 Inspect heaving lines, mooring lines, and fixed and running rigging for excessive wear.
03.13 Determine greenwich mean time (GMT) by using bessel's chronometer.
03.14 Determine position by using omega navigation system.
03.15 Steer a course by using the magnetic compass.
03.16 Determine "distance off" by using angular measurements.
03.17 Establish a vessel's dead reckoning (DR) track.
03.18 Determine position by means of celestial navigation.
03.19 Plot position by using loran and loran overprint charts.
03.20 Set sea watches.

04.0 MANEUVER AROUND OFFSHORE STRUCTURES--The student will be able to:

04.01 Assist personnel in boarding personnel basket.
04.02 Maneuver vessel to discharge passengers.
04.03 Maneuver vessel to discharge cargo.
04.04 Secure hoses on board vessel.
04.05 Secure lashings, hausers, or mooring lines on board vessel.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Barge and Boat Operation
PROGRAM NUMBER: 8751100

COURSE TITLE: Barge and Boat Operation 3
COURSE NUMBER: 8751130

COURSE DESCRIPTION:

This course is designed to provide instruction in duties and techniques of anchoring a vessel properly, the management duties and techniques of handling cargo for leading, storing, and unloading safely.

05.0 ANCHOR VESSEL--The student will be able to:

05.01 Anchor vessel.
05.02 Maneuver vessel to anchorage area.
05.03 Anchor vessel by using anchor winch.
05.04 Anchor vessel by using anchor windlass.
05.05 Stack (tier) anchor chain in chain locker.

06.0 MANAGE AND PERFORM CARGO HANDLING DUTIES--The student will be able to:

06.01 Adjust vessel's mooring lines to allow for variations of tide and current.
06.02 Determine if all cargo is aboard.
06.03 Determine if all deck cargo is secured.
06.04 Determine if vessel is loaded in compliance with stability laws.
06.05 Discharge cargo by using bulk cargo system.
06.06 Load cargo by using bulk cargo system.
06.07 Prepare list of lost or damaged cargo.

07.0 BRING VESSEL INTO PORT--The student will be able to:
07.06 Prepare vessel to take on fuel and lube oil.
07.07 Prepare to take on water aboard vessel.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Barge and Boat Operation PROGRAM NUMBER: 8751100

COURSE TITLE: Barge and Boat Operation 4 COURSE NUMBER: 8751140

COURSE DESCRIPTION:

This course is designed to provide instruction in managerial and maintenance duties for preventive maintenance and repair of the vital systems of a vessel.

08.0 PERFORM CREW OPERATIONAL AND MAINTENANCE DUTIES ABOARD VESSEL IN PORT--The student will be able to:

08.01 Arrange for dry docking vessel.
08.02 Change brushes in auxiliary engines.
08.03 Change lube oil filters on auxiliary engines.
08.04 Change fuel filters on auxiliary engines.
08.05 Determine if motor bearings are excessively warn.
08.06 Clean electric motor.
08.07 Prepare list of hoses, valves, connections, gaskets, and tanks needing repairs.
08.08 Determine if const-a-voltage regulator is functioning properly.
08.09 Determine if drive belts on air compressors are excessively loose.
08.10 Tighten panel box fittings to prevent vibration.
08.11 Clean keel cool strainers.
08.12 Clean oil coolers.
08.13 Clean oil strainers in marine gears.
08.14 Drain water out of fuel traps.
08.15 Tighten fuel and oil line connections on engines.
08.16 Inspect day tanks containing fuel for leaks.
08.17 Lubricate deck and engine room equipment on a regular schedule.
08.18 Determine vessel's manning requirements.
08.19 Splice eye into line.
08.20 Wash down vessel's superstructure and decks.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Barge and Boat Operation PROGRAM NUMBER: 8751100

COURSE TITLE: Barge and Boat Operation 5 COURSE NUMBER: 8751150

COURSE DESCRIPTION:

This course is designed to provide instruction in the management duties of safely running a galley, purchasing, storing, and inventory of all food items, the planning of menus, food preparation and serving of meals aboard the vessel, cleaning and maintenance of food preparation utensils and equipment.

09.0 PREPARE MEALS ABOARD VESSEL--The student will be able to:

09.01 Make yeast breads, biscuits, and cornbread.
09.02 Make pie crust.
09.03 Make cream filling for pie.
09.04 Make pancakes.
09.05 Make cakes.
09.06 Cook vegetables by boiling, simmering, and steaming.
09.07 Cook meat, fish, and fowl by broiling.
09.08 Cook meats, seafood, and fowl by braising.
09.09 Cook meat, fish, and fowl by roasting or baking.
09.10 Season and bread meat, seafood, and fowl for baking, roasting, broiling, and frying.
09.11 Cook eggs by frying and scrambling.
09.12 Make gravies.
09.13 Make coffee.
09.14 Make salads.
09.15 Prepare soup stock.
09.16 Prepare sandwiches.

09.17 Prepare dehydrated or concentrated foods.
09.18 Make soup with stock, meats, vegetables, and seasonings, as required by recipe.
09.19 Carve cooked meat.
09.20 Cut trim, and bone beef, lamb, pork, or fish into prescribed portions for steaks, chops, and fillets.
09.21 Clean and care for equipment.
09.22 Order food.
09.23 Plan menus.
09.24 Keep records for purchasing foods.
09.25 Store food.
09.26 Keep continuous inventory of food items.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Barge and Boat Operation

PROGRAM NUMBER: 8751100

COURSE TITLE: Barge and Boat Operation 6

COURSE NUMBER: 8751160

COURSE DESCRIPTION:

This course is designed to provide instruction in methods and techniques of determining course and position by the use of pathometer, radio direction finder, dead reconing plots and nautical charts, the planning and performing of emergency procedures used on vessels and employability skills.

07.0 BRING VESSEL INTO PORT--The student will be able to:

07.01 Determine approximate position and hazardous bottom conditions by using pathometer.
07.02 Determine position by using radio direction finder (RDF).
07.03 Inspect engine room equipment for proper maintenance and safety.
07.04 Determine vessel's course and position against dead reconing plots.
07.05 Correct noutical chart prior to departure.

10.0 PLAN AND PERFORM EMERGENCY PROCEDURES--The student will be able to:

10.01 Act as lookout to keep person in sight who has been lost overboard.
10.02 Administer first aid to prevent shock.
10.03 Administer first aid to control bleeding.
10.04 Administer CPR.
10.05 Launch lifeboat and life raft.
10.06 Close emergency fuel shutoff valves.
10.07 Extinguish class C fire.
10.08 Manuever life raft or lifeboat away from vessel.
10.09 Manuever vessel to return to area in which person was lost overboard.
10.10 Issue life preservers for use by passengers and crew.
10.11 Secure engine room to prevent spread of fire.
10.12 Send out distress signals.
10.13 Sound abandon - ship alarm.
10.14 Train crew to perform emergency procedures.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Basic Air Conditioning, Refrigeration and Heating Mechanics

CODE NUMBER: Secondary 8703000 Postsecondary ______

Florida CIP IN47.022100

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 10-12, 21

CERTIFICATION COVERAGE: AC HEAT ME 7 REFRG MECH @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as air conditioning, heating, refrigeration mechanics (50080200), air conditioning/heating mechanic's helpers (637.261-015), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, basic electrical, welding and brazing, tubing and piping, air conditioning and heating theory and practice, safety, hand and power tools, various types of specialty equipment, and mechanical techniques of the trade.

Listed below are the courses that comprise this program when offered at the secondary level:

8703010	Basic Air Conditioning, Refrigeration and Heating Mechanics 1
8703020	Basic Air Conditioning, Refrigeration and Heating Mechanics 2
8703030	Basic Air Conditioning, Refrigeration and Heating Mechanics 3
8703040	Basic Air Conditioning, Refrigeration and Heating Mechanics 4
8703050	Basic Air Conditioning, Refrigeration and Heating Mechanics 5
8703060	Basic Air Conditioning, Refrigeration and Heating Mechanics 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in wire - electrical, practice welding, soldering, and brazing, construct tubing and piping, practice safety, use hand and power tools, use specialty equipment, install, service, and repair components, install, service and repair systems.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of safe and efficient work practices.
02. Apply basic electrical fundamentals.
03. Use and care for test equipment.
04. Use and care for hand and power tools.
05. Use and care for specialty tools.
06. Install and service related components.
07. Apply air conditioning/heating theory.
08. Install and service heating and cooling related systems.
09. Install, maintain and repair heating systems.
10. Demonstrate employability skills.
11. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARD
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
SECONDARY NUMBER: 8703000

PROGRAM TITLE: Basic Air Conditioning, Refrigeration and Heating Mechanics
POSTSECONDARY NUMBER: __________

01.0 DEMONSTRATE KNOWLEDGE OF SAFE AND EFFICIENT WORK PRACTICES--The student will be able to:

01.01 Practice tool and equipment safety.
01.02 Practice housekeeping safety.
01.03 Practice power supply safety.
01.04 Practice welding and brazing safety.
01.05 Practice mechanical safety.
01.06 Practice personal safety.

02.0 APPLY BASIC ELECTRICAL FUNDAMENTALS--The student will be able to:

02.01 Practice safety.
02.02 Properly use and interpret test equipment.
02.03 Identify and apply voltage, current and resistance.
02.04 Calculate power consumption.
02.05 Identify AC from DC.
02.06 Apply Ohm's Law.
02.07 Identify power consumption.
02.08 Read and interpret schematics and pictorials.
02.09 Identify wire type and size.
02.10 Identify and use wire, conduit and romex.
02.11 Wire connections and splices.
02.12 Solder wire to components.
02.13 Practice electrical code (grounding, size, length, etc.)
02.14 Troubleshoot circuitry and or components.

03.0 USE AND CARE OF TEST EQUIPMENT--The student will be able to:

03.01 Use and interpret voltmeter.
03.02 Use and interpret amprobe.
03.03 Use and interpret ohmeter.
03.04 Use and interpret wattmeter.
03.05 Use and interpret leak detectors.
03.06 Use and interpret manifold gauges
03.07 Use and interpret mictor gauges.
03.08 Use and interpret direct test kit.
03.09 Use and interpret capacitor analyzer.
03.10 Use and interpret thermometers (remote and recording.)

04.0 USE AND CARE OF HAND AND POWER TOOLS--The student will be able to:

04.01 Identify hand tools.
04.02 Identify power tools.
04.03 Use hand tools properly.
04.04 Use power tools properly.
04.05 Practice safety with hand and power tools.

05.0 USE AND CARE OF SPECIALITY TOOLS--The student will be able to:

05.01 Identify and use swedging/flaring, bending gauges, bending torches, vacuum pumps, leak detectors, pinch off, charging cylinders, access valves, and tubing cutter.

06.0 INSTALL AND SERVICE RELATED COMPONENTS--The student will be able to:

06.01 Identify and install compressors.
06.02 Identify and install condensers.
06.03 Identify and install evaporators.
06.04 Identify and install metering devices.
06.05 Identify and install capacitors.
06.06 Identify and install motors.
06.07 Identify and install relays.
06.08 Identify and install thermostats.
06.09 Identify and install filter dryers.
06.10 Identify and install transformers.
06.11 Identify and install valves (various types).
06.12 Identify and install air movement devices.
06.13 Identify and install control circuits.
06.14 Identify and install switches (various types).

07.0 APPLY A/C HEATING THEORY--The student will be able to:

07.01 Define system components.
07.02 Define function of AC and heating.
07.03 Define pressure/temperature.
07.04 Define function of compressor.
07.05 Define function of condensor.
07.06 Define function of evaporator.
07.07 Define function of metering devices.
07.08 Define function of change of state.
07.09 Define function of refrigerant.
07.10 Define pressure drop.
07.11 Define temperature drop.
07.12 Define CFM and BTU.
07.13 Calculate heat load of an area.
07.14 Calculate appropriate BTU's for a given area.

08.0 INSTALL AND SERVICE HEATING AND COOLING RELATED SYSTEMS--The student will be able to:

08.01 Install and service window unit.
08.02 Install and service split system
08.03 Install and service package unit.
08.04 Install and service condenser.
08.05 Identify heat pumps and parts.
08.06 Identify gas furnace and parts.
08.07 Identify oil furnace and parts.
08.08 Identify solar components.
08.09 Identify different types of refrigeration equipment.

09.0 INSTALL, MAINTAIN AND REPAIR HEATING SYSTEMS--The student will be able to:

09.01 Install, service and repair a gas furnace.
09.02 Install, service and repair an oil furnace.
09.03 Install, service and repair an electric furnace.
09.04 Install, service and repair duct heaters.
09.05 Install, service and repair auxiliary heat strips.
09.06 Install, service and repair solar heating systems.
09.07 Install, service and repair miscellaneous heating equipment.
09.08 Apply local and national codes.
09.09 Install, service and repair hydronic systems.
09.10 Test and analyze heating air movement systems.

10.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

10.01 Conduct a job search.
10.02 Secure information about a job.
10.03 Identify documents which may be required when applying for a job interview.
10.04 Complete a job application form correctly.
10.05 Demonstrate competence in job interview techniques.
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
10.07 Identify acceptable work habits.
10.08 Demonstrate knowledge of how to make job changes appropriately.
10.09 Demonstrate acceptable employee health habits.

11.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

11.01 Define entrepreneurship.
11.02 Describe the importance of entrepreneurship to the American economy.
11.03 List the advantages and disadvantages of business ownership.
11.04 Identify the risks involved in ownership of a business.
11.05 Identify the necessary personal characteristics of a successful entrepreneur.
11.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Basic Air Conditioning, Refrigeration and Heating Mechanics — PROGRAM NUMBER: 8703000

COURSE TITLE: Basic Air Conditioning, Refrigeration and Heating Mechanics 1 — COURSE NUMBER: 8703010

COURSE DESCRIPTION:

This course is designed to provide an introduction to air conditioning, refrigeration and heating repair and installation. Safety, employability skills and handtools are included.

01.0 DEMONSTRATE KNOWLEDGE OF SAFE AND EFFICIENT WORK PRACTICES--The student will be able to:

01.01 Practice tool and equipment safety.
01.02 Practice housekeeping safety.
01.03 Practice power supply safety.
01.04 Practice welding and brazing safety.
01.05 Practice mechanical safety.
01.06 Practice personal safety.

04.0 USE AND CARE OF HAND AND POWER TOOLS--The student will be able to:

04.01 Identify hand tools.
04.02 Identify power tools.
04.03 Use hand tools properly.
04.04 Use power tools properly.
04.05 Practice safety with hands and power tools.

05.0 USE AND CARE OF SPECIALITY TOOLS--The student will be able to:

05.01 Identify and use swedging/flaring, bending gauges, bending torches, vacuum pumps, leak detectors, pinch off, charging cylinders, access valves and tubing cutter.

10.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS--The student will be able to:

10.01 Conduct a job search.
10.02 Secure information about a job.
10.03 Identify documents which may be required when applying for a job interview.
10.04 Complete a job application form correctly.
10.05 Demonstrate competence in job interview techniques.
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
10.07 Identify acceptable work habits.
10.08 Demonstrate knowledge of how to make job changes appropriately.
10.09 Demonstrate acceptable employee health habits.

11.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

11.01 Define entrepreneurship.
11.02 Describe the importance of entrepreneurship to the American economy.
11.03 List the advantages and disadvantages of business ownership.
11.04 Identify the risks involved in ownership of a business.
11.05 Identify the necessary personal characteristics of a successful entrepreneur.
11.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Air Conditioning, Refrigeration and Heating Mechanics PROGRAM NUMBER: 8703000

COURSE TITLE: Basic Air Conditioning, Refrigeration and Heating Mechanics 2 COURSE NUMBER: 8703020

COURSE DESCRIPTION:

This course is designed to provide instruction in electron theory, Ohm's law, reading schematics, wire types and sizes, soldering and electrical code.

02.0 APPLY BASIC ELECTRICAL FUNDAMENTALS--The student will be able to:

02.01 Practice safety.
02.02 Properly use and interpret test equipment.
02.03 Identify and apply voltage, current and resistance.
02.04 Calculate power consumption.
02.05 Identify AC from DC.
02.06 Apply Ohm's law.
02.07 Identify power consumption.
02.08 Read and interpret schematics and pictorials.
02.09 Identify wire type and size.
02.10 Identify and use wire, conduit and romex.
02.11 Wire connections and splices.
02.12 Solder wire to components.
02.13 Practice electrical code (grounding, size, length, etc.)
02.14 Troubleshoot circuitry and or components.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Air Conditioning, Refrigeration and Heating Mechanics PROGRAM NUMBER: 8703000

COURSE TITLE: Basic Air Conditioning Refrigeration and Heating Mechanics 3 COURSE NUMBER: 8703030

COURSE DESCRIPTION:

This course is designed to provide instruction in the use of test equipment.

03.0 USE AND CARE FOR AIR CONDITIONING, REFRIGERATION AND HEATING TEST EQUIPMENT--The student will be able to:

03.01 Use and interpret voltmeter.
03.02 Use and interpret amprobe.
03.03 Use and interpret ohmeter.
03.04 Use and interpret wattmeter.
03.05 Use and interpret leak detectors.
03.06 Use and interpret manifold gauges.
03.07 Use and interpret mictor gauges.
03.08 Use and interpret direct test kit.
03.09 Use and interpret capacitor analyzer.
03.10 Use and interpret thermometers (remote and recording.)

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Air Conditioning, Refrigeration and Heating Mechanics PROGRAM NUMBER: 8703000

COURSE TITLE: Basic Air Conditioning, Refrigeration and Heating Mechanics 4 COURSE NUMBER: 8703040

COURSE DESCRIPTION:

This course is designed to provide instruction in the identification and proper installation of electrical and mechanical components of an air conditioning system.

07.0 APPLY AIR CONDITIONING HEATING THEORY--The student will be able to:

07.01 Define system components.
07.02 Define function of air conditioning and heating.
07.03 Define pressure/temperature.
07.04 Define function of compressor.
07.05 Define function of condenser.
07.06 Define function of evaporator.
07.07 Define function of metering devices.
07.08 Define function of change of state.
07.09 Define function of refrigerant.
07.10 Define pressure drop.
07.11 Define temperature drop.
07.12 Define CFM and BTU.
07.13 Calculate heat load of an area.
07.14 Calculate appropriate BTUs for a given area.

06.0 INSTALL AND SERVICE RELATED COMPONENTS--The student will be able to:

06.01 Identify and install compressors.
06.02 Identify and install condensers.
06.03 Identify and install evaporators.
06.04 Identify and install metering devices.
06.05 Identify and install capacitor.
06.06 Identify and install motors.
06.07 Identify and install relays.
06.08 Identify and install thermostats.
06.09 Identify and install filter dryers.
06.10 Identify and install transformers.
06.11 Identify and install valves (various types.)
06.12 Identify and install air movement devices.
06.13 Identify and install control circuits.
06.14 Identify and install switches (various types.)

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Air Conditioning, Refrigeration and Heating Mechanics PROGRAM NUMBER: 8703000

COURSE TITLE: Basic Air Conditioning, Refrigeration and Heating Mechanics 5 COURSE NUMBER: 8703050

COURSE DESCRIPTION:

This course is designed to provide instruction in the installation and service of air conditioning systems.

08.0 INSTALL AND SERVICE HEATING AND COOLING RELATED SYSTEMS--The student will be able to:

08.01 Install and service window unit.
08.02 Install and service split system.
08.03 Install and service package unit.
08.04 Install and service condenser.
08.05 Identify heat pumps and parts.
08.06 Identify gas furnace and parts.
08.07 Identify oil furnace and parts.
08.08 Identify solar components.
08.09 Identify different types of refrigeration equipment.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Air Conditioning, Refrigeration and Heating Mechanics

PROGRAM NUMBER: 8703000

COURSE TITLE: Basic Air Conditioning Refrigeration and Heating Mechanics 6

COURSE NUMBER: 8703060

COURSE DESCRIPTION:

This course is designed to provide instruction in the installation and service of heating systems.

09.0 INSTALL, MAINTAIN AND REPAIR HEATING SYSTEMS--The student will be able to:

09.01 Install, service and repair a gas furnace.
09.02 Install, service and repair an oil furnace.
09.03 Install, service and repair electric furnace.
09.04 Install, service and repair duct heaters.
09.05 Install, service and repair auxiliary heat strips.
09.06 Install, service and repair solar heating systems.
09.07 Install, service and repair miscellaneous heating equipment.
09.08 Apply local and national codes.
09.09 Install, service and repair hydronic systems.
09.10 Test and analyze heating air movement systems.

CURRICULUM FRAMEWORK — PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION — EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Basic Automotive Body Repair and Refinishing

CODE NUMBER: Secondary 8709000 — Postsecondary ______

Florida CIP IN47.062300

SECONDARY SCHOOL CREDITS 6 — COLLEGE CREDITS ______ — POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

___ Postsecondary Vocational X Other 10-12, 21

CERTIFICATION COVERAGE: AUTO IND @ 7 AUTO BODY 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as automobile body repairer helpers (807.687-010) and automotive painter helpers (845.684-014), including such OES Survey-based Matrix Occupational Code titles as Automotive Body Repairer, (50080800), Glass Installer (50141801), Painter, Production (61084210), Painter, Automotive (61084201), Tinter (61083852), and Other Semi-Skilled Workers, Repair Finished Metal (50080600), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, basic trade skills, refinishing skills, sheet metal repair skills, related welding skills, use of plastic fillers, paint systems, undercoats, and minor miscellaneous repairs.

Listed below are the courses that comprise this program when offered at the secondary level:

8709010	Basic Automotive Body Repair and Refinishing 1
8709020	Basic Automotive Body Repair and Refinishing 2
8709030	Basic Automotive Body Repair and Refinishing 3
8709040	Basic Automotive Body Repair and Refinishing 4
8709050	Basic Automotive Body Repair and Refinishing 5
8709060	Basic Automotive Body Repair and Refinishing 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in use of hand and power tools, panel repairs, use of frame measurement equipment, application of fillers, paint systems, use of shop materials, glass replacement, and the use of MIG, oxyacetylene and plastic welders.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communications, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After sucessfully completing this program, the individual will be able to:

01. Demonstrate shop and occupational safety skills
02. Prepare vehicles for repair and refinishing
03. Repair, replace, and adjust outer body panels
04. Prepare parts and panels for metal finishing
05. Prepare and apply plastic body-fillers
06. Perform welding operations
07. Inspect and repair frame-type vehicle bodies
08. Prepare surfaces for refinishing
09. Maintain and operate spray equipment
10. Select and apply appropriate paints and finishes
11. Diagnose and correct paint-application problems
12. Diagnose and correct finish defects
13. Perform miscellaneous repairs
14. Demonstrate employability skills
15. Demonstrate an understanding of entrepreneurship

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8709000
PROGRAM TITLE: Basic Automotive Body Repair and Refinishing POSTSECONDARY NUMBER: ______

01.0 DEMONSTRATE SHOP AND OCCUPATIONAL SAFETY SKILLS--The student will be able to:

01.01 Comply with safety rules regarding chemicals
01.02 Comply with safety rules regarding personal clothing and devices
01.03 Comply with safety rules regarding hand tools and power equipment
01.04 Comply with shop safety rules and regulations
01.05 Identify sources of airborne contamination and other hazards; take necessary steps to protect the health of the painter and other personnel
01.06 Inspect air makeup and exhaust systems (including intake filters, exhaust filters, fans and other mechanical components of the system) to insure proper filtering and ventilation
01.07 Identify career opportunities in auto body repair
01.08 Explain requirements for continuing education in auto body repair

02.0 PREPARE VEHICLES FOR REPAIR AND REFINISHING--The student will be able to:

02.01 Remove damaged outside trim and moldings
02.02 Remove damaged or necessary inside trim and moldings
02.03 Remove damaged, nonstructural body panels and components that may interfere with, or be damaged during, repair
02.04 Protect panels and parts adjacent to repair areas to prevent damage
02.05 Remove dirt, corrosion, undercoatings, sealers, and/or other protective coatings necessary to perform repairs to structural areas
02.06 Remove repairable plastics and other parts that are recommended for off-car repair

03.0 REPAIR, REPLACE, AND ADJUST OUTER BODY PANELS--The student will be able to:

03.01 Remove and replace a bolted panel or panel assembly
03.02 Remove and replace hoods, hood hinges, and hood latches
03.03 Remove and replace deck lids, lid hinges, and lid latches
03.04 Remove and replace doors, tailgates, hatches, liftgates, and hinges
03.05 Remove and replace bumpers, reinforcements, guards, isolators, and mounting hardware (release pressure from gas- and oil-filled energy-absorbing-type bumper isolators that are being discarded)
03.06 Check and adjust hood clearances to adjoining panels
03.07 Check and adjust deck lid, liftgate, and hatch clearances to adjoining panels
03.08 Check door-hinge condition; check door frames for square; check and adjust door clearances (where adjustable) along quarter panels, doors, rocker panels, fenders, and tops
03.09 Check and adjust latch assemblies on all hinged components
03.10 Check and adjust bumper clearances to adjacent body and filler panels
03.11 Straighten roughed-out contours of damaged panels to a surface condition for body filling or metal finishing
03.12 Weld cracked or torn steel body-panels; reweld broken welds
03.13 Cold-shrink stretched panel-areas back to contour
03.14 Restore protective coatings and sealants

04.0 PREPARE PARTS AND PANELS FOR METAL FINISHING--The student will be able to:

04.01 Identify specification(s) of metals used in automobiles
04.02 Identify heat effects on metals
04.03 Identify the importance of maintaining the structural integrity of an auto body
04.04 Grind the paint from the damaged area of a body panel
04.05 Pick and file the damaged area of a body panel to eliminate surface irregularities
04.06 Disc-sand the repaired body-panel to produce final smoothness

05.0 PREPARE AND APPLY PLASTIC BODY-FILLERS--The student will be able to:

05.01 Mix plastic filler
05.02 Apply plastic body-filler and cheese-grate during curing
05.03 Rough-sand cured plastic body-filler to contour, and then finish-sand

06.0 PERFORM WELDING OPERATIONS--The student will be able to:

06.01 Set up, operate, and maintain MIG, spot, oxyacetylene, and other welding equipment

07.0 INSPECT AND REPAIR FRAME-TYPE VEHICLE BODIES--The student will be able to:

07.01 Determine the extent of direct and indirect damage and the direction of impact, and plan methods and order of repairs
07.02 Clean, prime, and protective-coat repaired frame areas
07.03 Cold-shrink stretched panel-areas back to contour
07.04 Recheck panel contour and alignment after shaping and correct or adjust as necessary

08.0 PREPARE SURFACES FOR REFINISHING--The student will be able to:

08.01 Inspect and identify types of finishes and surface conditons and develop a plan for refinishing
08.02 Remove and store trim and molding
08.03 Remove dirt, wax, and road grime from areas to be refinished and from adjacent surfaces
08.04 Mask trim and other areas that will not be refinished
08.05 Remove paint finishes (chemically or mechanically)
08.06 Dry- or wet-sand areas to be refinished
08.07 Feather-edge broken areas to be refinished
08.08 Identify types of metals and apply suitable metal treatments
08.09 Mix primer, primer-surfacer, or primer-sealer and spray onto the surface of repaired areas
08.10 Apply glazing putty to pin-holes, scratches, and other minor surface imperfections
08.11 Dry- or wet-sand areas to which primer-surfacer and glazing putty have been applied
08.12 Compound around the edges of repaired areas to be refinished
08.13 Blow dust from areas to be refinished including cracks or moldings of adjacent areas
08.14 Clean area to be refinished with a proper solvent
08.15 Remove, with a tack rag, any dust or lint particles from the areas to be refinished
08.16 Apply suitable sealers to the areas being refinished when sealing is needed or desirable

09.0 MAINTAIN AND OPERATE SPRAY EQUIPMENT--The student will be able to:

09.01 Check and adjust air pressure at the spray gun
09.02 Adjust spray-gun fluid and pattern-control valves
09.03 Use appropriate spray techniques (gun arc, gun angle, gun distance, gun speed, and spray-pattern overlap) for the finish being applied
09.04 Inspect, clean, and determine the condition and adequacy of spray guns and related equipment (air hoses, regulators, air lines, and compressors)

10.0 SELECT AND APPLY APPROPRIATE PAINTS AND FINISHES--The student will be able to:

10.01 Select the proper spray mask, inspect the spray mask to insure proper fit and operation, and inspect the condition of the mask filters and other components
10.02 Determine the type and color of paint already on a vehicle
10.03 Shake, stir, thin or reduce, and strain paint
10.04 Apply acrylic enamel for panel repairs
10.05 Apply acrylic enamel for over-all refinishing
10.06 Apply acrylic lacquer for spot repairs
10.07 Apply acrylic lacquer for panel repairs
10.08 Check for color-matching of all applied materials

10.09 Sand, buff, and polish finishes where necessary
10.10 Identify the types of plastic parts to be finished and determine the proper refinishing procedure
10.11 Apply a finish coat to plastic parts
10.12 Clean, condition, and refinish vinyl (e.g. upholstery, dashes, and tops)
10.13 Clean and detail a vehicle after completion of refinishing
10.14 Apply stone-chip-resistant coatings to lower body areas
10.15 Restore corrosion-resistant coatings, caulking, and seam sealers to repaired areas

11.0 DIAGNOSE AND CORRECT PAINT-APPLICATION PROBLEMS--The student will be able to:

11.01 Identify blistering or raising of the paint surface, determine the cause(s), and correct the condition
11.02 Identify blushing (milky or dull mist-formation), determine the cause(s), and correct the condition
11.03 Identify bull's-eye effects in the paint surface, determine the cause(s), and correct the condition
11.04 Identify crow's-feet a or crazing appearance in the paint surface, determine the cause(s), and correct the condition
11.05 Check for dirt in the painted surface, determine the source(s), and correct the condition
11.06 Identify a dry-spray pattern in the paint surface, determine the cause(s), and correct the condition
11.07 Identify the appearance of fisheyes in the finish after it has been applied, determine the cause(s), and correct the condition
11.08 Identify lifting (surface distortion or shriveling) while the topcoat is being applied, identify the cause(s), and correct the condition
11.09 Identify molting (or streaking) in metallic-paint finishes, determine the cause(s), and correct the condition
11.10 Identify the orange-peel appearance of the refinished surface, determine the cause(s), and correct the condition
11.11 Identify overspray resulting from overlap, determine the cause(s), and correct the condition
11.12 Identify a pin-holing (solvent-popping) appearance in a freshly-painted surface, determine the cause(s), and correct the condition
11.13 Identify sags and runs in paint surfaces, determine the cause(s), and correct the condition
11.14 Identify sand-scratch swelling, determine the cause(s), and correct the condition
11.15 Identify shrinking or splitting while the finish is drying around repaired areas, determine the cause(s), and correct the condition
11.16 Identify tape-tracking, determine the cause(s), and correct the condition
11.17 Identify bleeding, determine the cause(s), and correct the condition

12.0 DIAGNOSE AND CORRECT FINISH DEFECTS--The student will be able to:

12.01 Identify poor adhesion, determine the cause(s), and take action to correct the condition
12.02 Identify paint-cracking (crow's-feet or line-checking, micro-checking, etc.) and take action to correct the condition
12.03 Identify the orange-peel appearance of a finished surface and take action to correct the condition
12.04 Check for rust spots on the surface, determine the cause(s), and take action to correct the condition
12.05 Identify a pin-holing (solvent-popping) or blistering appearance in paint surfaces, determine the cause(s), and take action to correct the condition
12.06 Identify water-spotting on paint surfaces and take action to correct the condition
12.07 Identify wrinkling of enamel and take action to correct the condition
12.08 Identify buffing-wheel burns on a painted surface, determine the cause(s), and take action to correct the condition
12.09 Identify finish damage caused by bird droppings, tree sap, and other natural causes and take action to correct the condition

12.10 Identify finish damage caused by airborne overspray, acids, soot, and other industrial-related causes and take action to correct the condition
12.11 Identify die-back conditions (both dulling of the paint film showing haziness and film distortion showing shrinking) and take action to correct the condition
12.12 Identify chalking (or oxidation) and take action to correct the condition

13.0 PERFORM MISCELLANEOUS REPAIRS--The student will be able to:

13.01 Inspect, adjust, repair, or replace window regulators, run channels, glass, power mechanisms, and related controls
13.02 Diagnose and repair water leaks, dust leaks, and wind noises
13.03 Inspect, repair, or replace weatherstripping
13.04 Inspect, remove, and replace all stationary glass (including windshields, back lights, etc.) using manufacturers' recommended installation materials and procedures
13.05 Repair damaged circuits and wires
13.06 Align headlamps
13.07 Apply rust-repair methods including grinding, sandblasting, and metal preparation

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents that may be required when applying for a job.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Automotive Body Repair and Refinishing PROGRAM NUMBER: 8709000

COURSE TITLE: Basic Automotive Body Repair and Refinishing 1 COURSE NUMBER: 8709010

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for demonstrating shop and occupational safety skills and employability skills, and comprehending and complying with requirements concerning legal liability and consequent insurance implications.

01.0 DEMONSTRATE SHOP AND OCCUPATIONAL SAFETY SKILLS--The student will be able to:

01.01 Comply with safety rules regarding chemicals
01.02 Comply with safety rules regarding personal clothing and devices
01.03 Comply with safety rules regarding hand tools and power equipment
01.04 Comply with shop safety rules and regulations
01.05 Identify sources of airborne contamination and other hazards; take necessary steps to protect the health of the painter and other personnel
01.06 Inspect air makeup and exhaust systems (including intake filters, exhaust filters, fans and other mechanical components of the system) to insure proper filtering and ventilation
01.07 Identify career opportunities in auto body repair
01.08 Explain requirements for continuing education in auto body repair

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents that may be required when applying for a job.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Automotive Body Repair and Refinishing PROGRAM NUMBER: 8709000

COURSE TITLE: Basic Automotive Body Repair and Refinishing 2 COURSE NUMBER: 8709020

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for preparing vehicles for repair and refinishing and repair, replacement and adjustment of outer body panels.

02.0 PREPARE VEHICLES FOR REPAIR AND REFINISHING--The student will be able to:

02.01 Remove damaged outside trim and moldings
02.02 Remove damaged or necessary inside trim and moldings
02.03 Remove damaged, nonstructural body panels and components that may interfere with, or be damaged during, repair
02.04 Protect panels and parts adjacent to repair areas to prevent damage

02.05 Remove dirt, corrosion, undercoatings, sealers, and/or other protective coatings necessary to perform repairs to structural areas
02.06 Remove repairable plastics and other parts that are recommended for off-car repair

03.0 REPAIR, REPLACE, AND ADJUST OUTER BODY PANELS--The student will be able to:

03.01 Remove and replace a bolted panel or panel assembly
03.02 Remove and replace hoods, hood hinges, and hood latches
03.03 Remove and replace deck lids, lid hinges, and lid latches
03.04 Remove and replace doors, tailgates, hatches, liftgates, and hinges
03.05 Remove and replace bumpers, reinforcements, guards, isolators, and mounting hardware (release pressure from gas- and oil-filled energy-absorbing-type bumper isolators that are being discarded)
03.06 Check and adjust hood clearances to adjoining panels
03.07 Check and adjust deck lid, liftgate, and hatch clearances to adjoining panels
03.08 Check door-hinge condition; check door frames for square; check and adjust door clearances (where adjustable) along quarter panels, doors, rocker panels, fenders, and tops
03.09 Check and adjust latch assemblies on all hinged components
03.10 Check and adjust bumper clearances to adjacent body and filler panels
03.11 Straighten roughed-out contours of damaged panels to a surface condition for body filling or metal finishing
03.12 Weld cracked or torn steel body-panels; reweld broken welds
03.13 Cold-shrink stretched panel-areas back to contour
03.14 Restore protective coatings and sealants

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Automotive Body Repair and Refinishing

PROGRAM NUMBER: 8709000

COURSE TITLE: Basic Automotive Body Repair and Refinishing 3

COURSE NUMBER: 8709030

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for preparing parts and panels for metal finishing, applying plastic body-fillers, and performing welding operations.

04.0 PREPARE PARTS AND PANELS FOR METAL FINISHING--The student will be able to:

04.01 Identify specification(s) of metals used in automobiles
04.02 Identify heat effects on metals
04.03 Identify the importance of maintaining the structural integrity of an auto body
04.04 Grind the paint from the damaged area of a body panel
04.05 Pick and file the damaged area of a body panel to eliminate surface irregularities
04.06 Disc-sand the repaired body-panel to produce final smoothness

05.0 PREPARE AND APPLY PLASTIC BODY-FILLERS--The student will be able to:

05.01 Mix plastic filler
05.02 Apply plastic body-filler and cheese-grate during curing
05.03 Rough-sand cured plastic body-filler to contour, and then finish-sand

06.0 PERFORM WELDING OPERATIONS--The student will be able to:

06.01 Set up, operate, and maintain MIG, spot, oxyacetylene, and other welding equipment

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STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Basic Automotive Body Repair and Refinishing
PROGRAM NUMBER: 8709000

COURSE TITLE: Basic Automotive Body Repair and Refinishing 4
COURSE NUMBER: 8709040

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for inspecting and repairing frame-type vehicle bodies and for preparing surfaces for refinishing.

07.0 INSPECT AND REPAIR FRAME-TYPE VEHICLE BODIES--The student will be able to:

07.01 Determine the extent of direct and indirect damage and the direction of impact, and plan methods and order of repairs
07.02 Clean, prime, and protective-coat repaired frame areas
07.03 Cold-shrink stretched panel-areas back to contour
07.04 Recheck panel contour and alignment after shaping and correct or adjust as necessary

08.0 PREPARE SURFACES FOR REFINISHING--The student will be able to:

08.01 Inspect and identify types of finishes and surface conditons and develop a plan for refinishing
08.02 Remove and store trim and molding
08.03 Remove dirt, wax, and road grime from areas to be refinished and from adjacent surfaces
08.04 Mask trim and other areas that will not be refinished
08.05 Remove paint finishes (chemically or mechanically)
08.06 Dry- or wet-sand areas to be refinished
08.07 Feather-edge broken areas to be refinished
08.08 Identify types of metals and apply suitable metal treatments
08.09 Mix primer, primer-surfacer, or primer-sealer and spray onto the surface of repaired areas
08.10 Apply glazing putty to pin-holes, scratches, and other minor surface imperfections
08.11 Dry- or wet-sand areas to which primer-surfacer and glazing putty have been applied
08.12 Compound around the edges of repaired areas to be refinished
08.13 Blow dust from areas to be refinished including cracks or moldings of adjacent areas
08.14 Clean area to be refinished with a proper solvent
08.15 Remove, with a tack rag, any dust or lint particles from the areas to be refinished
08.16 Apply suitable sealers to the areas being refinished when sealing is needed or desirable

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STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Basic Automotive Body Repair and Refinishing
PROGRAM NUMBER: 8709000

COURSE TITLE: Basic Automotive Body Repair and Refinishing 5
COURSE NUMBER: 8709050

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for maintaining and operating spray equipment, selecting and applying appropriate paints and finishes, and diagnosing and correcting paint-application problems.

09.0 MAINTAIN AND OPERATE SPRAY EQUIPMENT--The student will be able to:

09.01 Check and adjust air pressure at the spray gun
09.02 Adjust spray-gun fluid and pattern-control valves
09.03 Use appropriate spray techniques (gun arc, gun angle, gun distance, gun speed, and spray-pattern overlap) for the finish being applied
09.04 Inspect, clean, and determine the condition and adequacy of spray guns and related equipment (air hoses, regulators, air lines, and compressors)

10.0 SELECT AND APPLY APPROPRIATE PAINTS AND FINISHES--The student will be able to:

10.01 Select the proper spray mask, inspect the spray mask to insure proper fit and operation, and inspect the condition of the mask filters and other components
10.02 Determine the type and color of paint already on a vehicle
10.03 Shake, stir, thin or reduce, and strain paint
10.04 Apply acrylic enamel for panel repairs
10.05 Apply acrylic enamel for over-all refinishing
10.06 Apply acrylic lacquer for spot repairs
10.07 Apply acrylic lacquer for panel repairs
10.08 Check for color-matching of all applied materials
10.09 Sand, buff, and polish finishes where necessary
10.10 Identify the types of plastic parts to be finished and determine the proper refinishing procedure
10.11 Apply a finish coat to plastic parts
10.12 Clean, condition, and refinish vinyl (e.g. upholstery, dashes, and tops)
10.13 Clean and detail a vehicle after completion of refinishing
10.14 Apply stone-chip-resistant coatings to lower body areas
10.15 Restore corrosion-resistant coatings, caulking, and seam sealers to repaired areas

11.0 DIAGNOSE AND CORRECT PAINT-APPLICATION PROBLEMS--The student will be able to:

11.01 Identify blistering or raising of the paint surface, determine the cause(s), and correct the condition
11.02 Identify blushing (milky or dull mist-formation), determine the cause(s), and correct the condition
11.03 Identify bull's-eye effects in the paint surface, determine the cause(s), and correct the condition
11.04 Identify crow's-feet a or crazing appearance in the paint surface, determine the cause(s), and correct the condition
11.05 Check for dirt in the painted surface, determine the source(s), and correct the condition
11.06 Identify a dry-spray pattern in the paint surface, determine the cause(s), and correct the condition
11.07 Identify the appearance of fisheyes in the finish after it has been applied, determine the cause(s), and correct the condition
11.08 Identify lifting (surface distortion or shriveling) while the topcoat is being applied, identify the cause(s), and correct the condition
11.09 Identify molting (or streaking) in metallic-paint finishes, determine the cause(s), and correct the condition
11.10 Identify the orange-peel appearance of the refinished surface, determine the cause(s), and correct the condition
11.11 Identify overspray resulting from overlap, determine the cause(s), and correct the condition
11.12 Identify a pin-holing (solvent-popping) appearance in a freshly-painted surface, determine the cause(s), and correct the condition

11.13 Identify sags and runs in paint surfaces, determine the cause(s), and correct the condition
11.14 Identify sand-scratch swelling, determine the cause(s), and correct the condition
11.15 Identify shrinking or splitting while the finish is drying around repaired areas, determine the cause(s), and correct the condition
11.16 Identify tape-tracking, determine the cause(s), and correct the condition
11.17 Identify bleeding, determine the cause(s), and correct the condition

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STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Automotive Body Repair and Refinishing

PROGRAM NUMBER: 8709000

COURSE TITLE: Basic Automotive Body Repair and Refinishing 6

COURSE NUMBER: 8709060

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for diagnosing and correcting finish defects, performing miscellaneous repairs.

12.0 DIAGNOSE AND CORRECT FINISH DEFECTS--The student will be able to:

12.01 Identify poor adhesion, determine the cause(s), and take action to correct the condition
12.02 Identify paint-cracking (crow's-feet or line-checking, micro-checking, etc.) and take action to correct the condition
12.03 Identify the orange-peel appearance of a finished surface and take action to correct the condition
12.04 Check for rust spots on the surface, determine the cause(s), and take action to correct the condition
12.05 Identify a pin-holing (solvent-popping) or blistering appearance in paint surfaces, determine the cause(s), and take action to correct the condition
12.06 Identify water-spotting on paint surfaces and take action to correct the condition
12.07 Identify wrinkling of enamel and take action to correct the condition
12.08 Identify buffing-wheel burns on a painted surface, determine the cause(s), and take action to correct the condition
12.09 Identify finish damage caused by bird droppings, tree sap, and other natural causes and take action to correct the condition
12.10 Identify finish damage caused by airborne overspray, acids, soot, and other industrial-related causes and take action to correct the condition
12.11 Identify die-back conditions (both dulling of the paint film showing haziness and film distortion showing shrinking) and take action to correct the condition
12.12 Identify chalking (or oxidation) and take action to correct the condition

13.0 PERFORM MISCELLANEOUS REPAIRS--The student will be able to:

13.01 Inspect, adjust, repair, or replace window regulators, run channels, glass, power mechanisms, and related controls
13.02 Diagnose and repair water leaks, dust leaks, and wind noises
13.03 Inspect, repair, or replace weatherstripping
13.04 Inspect, remove, and replace all stationary glass (including windshields, back lights, etc.) using manufacturers' recommended installation materials and procedures
13.05 Repair damaged circuits and wires
13.06 Align headlamps
13.07 Apply rust-repair methods including grinding, sandblasting, and metal preparation

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Basic Automotive Mechanics

CODE NUMBER: Secondary 8709100 Postsecondary ___

Florida CIP IN47.062400

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 10-12, 21

CERTIFICATION COVERAGE: AUTO MECH 7 AUTO IND @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as automobile mechanic helpers (602.684-014), front end mechanics (620.281-038), brake mechanics (620.281-026), automobile air conditioning mechanics (620.281-010), and electrical system specialists (825.281-022).

The program provides instruction in diagnosis of malfunctions in the repair of engines, fuel, electrical, cooling and brake systems; drive train and suspension systems; and radiators, transmission and carburetors.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, minor engine tune up, servicing automotive components, troubleshooting skills, the repair and overhaul of front ends, brakes and air conditioning systems, and basic shop management and safety skills.

Listed below are the courses that comprise this program when offered at the secondary level:

8709110	Basic Automotive Mechanics 1
8709120	Basic Automotive Mechanics 2 - Automotive Electronic Specialist
8709130	Basic Automotive Mechanics 3 - Front End Specialist
8709140	Basic Automotive Mechanics 4 - Brake Specialist
8709150	Basic Automotive Mechanics 5 - Heating & Air Conditioning Specialist
8709160	Basic Automotive Mechanics 6 - Engine & Transmission Specialist

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in fundamentals and service in the following areas: automatic and manual transmissions; drive trains; steering; suspension; brakes; and electrical systems. The tools, equipment, materials, and processes used in the laboratory should be equal to those used in the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction is utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on the job and in school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the students' individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the individual will be able to:

01.0 Demonstrate basic knowledge of automotive mechanics.
02.0 Apply electrical and electronic skills in diagnosing/troubleshooting malfunctions of electrical/electronic components
03.0 Demonstrate proficiency in servicing steering, suspension, & wheel systems services.
04.0 Demonstrate proficiency in automotive brake service
05.0 Demonstrate proficiency in cooling, air conditioning. & heating services.
06.0 Demonstrate proficiency in engine performance service.
07.0 Demonstrate proficiency in automatic transmission/trans-axle service.
08.0 Demonstrate proficiency in servicing manual drive trains and axles.
09.0 Demonstrate employability skills.
10.0 Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial SECONDARY NUMBER 8709100

PROGRAM TITLE: Basic Auto Mechanics PROGRAM NUMBER:

01.0 DEMONSTRATE BASIC KNOWLEDGE OF AUTOMOTIVE MECHANICS--The student will be able to:

01.01 Apply shop safety rules and procedures.
01.02 Use and maintain hand tools such as screwdrivers, special-application pliers, hammers, chisels, punches, special-application wrenches and sockets, files, hacksaws, bench vises, and c-clamps.
01.03 Demonstrate use of precision measuring tools.
01.04 Apply electrical safety rules and procedures.
01.05 Apply fire safety rules and procedures.
01.06 Apply basic welding skills related to the automobile industry.
01.07 Use and maintain power tools such as drills, bench grinders, drill presses, hydraulic presses, impact wrenches, air chisels, parts washers, hydraulic jacks, and vehicle hoists.
01.08 Use and apply basic electrical and electronic test equipment and meters.
01.09 Use and install fasteners such as screws and bolts, key screw. extractors, helicoil inserts, and thread cutting taps and dies.
01.10 Apply basic math skills.
01.11 Apply metric math skills.
01.12 Lubricate and service chassis.
01.13 Demonstrate use of multiple- and single volume type shop manuals.
01.14 Demonstrate use of specification handbooks and tuneup charts.
01.15 Demonstrate use of Motors, Chilton, Mitchell and other service manuals.
01.16 Understand electrical terms, magnetism, electrical current flow and Ohms' law, and sources.
01.17 Understand and apply the rules of series circuits.
01.18 Understand and apply the rules of parallel circuits.
01.19 Understand and apply the rules of series-parallel circuits.
01.20 Understand steering geometry and suspension geometry such as caster, camber, toe-in, kingpin inclination (steering axis), and toe-in and toe-out on turns.
01.21 Understand the function of steering and suspension system components such as coil springs, leaf springs, torsion bars, twin "I" beams, quadralink, rubber bushings, shock absorbers, tie rods, ball joints, shackles, idler arm, pitman arm, and control arm.
01.22 Understand manual and power steering operation--integral and linkage types--such as power steering pump, power steering control valve, and power steering fluid leaks.
01.23 Understand drum brake operation such as adjusters, wheel cylinder, pull, grab, chatter, noise, pulsations, fade, and lining conditions.
01.24 Understand disc brake operation such as caliper, piston, pull, grab, chatter, pulsations, fade, and lining conditions.
01.25 Understand brake system valve operation such as pressure. differential valve, proportional valve, metering valve, and brake warning light.
01.26 Understand pedal height.
01.27 Demonstrate an understanding of basic heating and cooling systems.
01.28 Understand basic air conditioning systems.
01.29 Demonstrate knowledge of engine component functions and driveability.
01.30 Understand basic ignition and fuel systems.
01.31 Understand rear axle operation such as differential action; limited slip mechanisms; floating, non-floating, and semi-floating.
01.32 Understand drive shaft operation, drive shaft construction, and universal joint operation such as single joint, constant velocity, joint working angle, joint phasing, slip joint joint, splined output, and splined drive shaft.
01.33 Understand automatic transmission operation such as fluid coupling, torque converter, plantary gear system, power flow, hydraulic system, lubricant, and cooling.
01.34 Understand clutch operation.
01.35 Understand clutch release mechanisms, to include linkage and hydraulic.

01.36 Understand manual transmission operation such as torque multiplication, power flow, sliding gears, constant mesh gear, synchronizer action, and shift mechanisms.
01.37 Understand overdrive operation.
01.38 Demonstrate knowledge of internal engine components.

02.0 APPLY ELECTRICAL AND ELECTRONIC SKILLS IN DIAGNOSING/TROUBLESHOOTING MALFUNCTIONS OF ELECTRICAL/ELECTRONIC COMPONENTS (Computerized or Non-Computerized)--The student will be able to:

02.01 Diagnose engine malfunctions.
02.02 Perform power checks with test lights.
02.03 Perform continuity tests.
02.04 Measure voltage drop, current flow, and resistance in a circuit or component with a multimeter.
02.05 Locate an open circuit or a short circuit.
02.06 Analyze cranking system malfunctions.
02.07 Analyze charging system malfunctions.
02.08 Service and test batteries.
02.09 Remove and replace light bulbs.
02.10 Inspect, remove, and replace alternator belts.
02.11 Test, remove, and replace fuses and circuit breakers.
02.12 Replace and test starters.
02.13 Test and overhaul alternators.
02.14 Remove and replace regulators.
02.15 Inspect and repair lighting systems.
02.16 Diagnose, repair or replace turn signal and stoplight switches.
02.17 Test and replace electrical system switches.
02.18 Diagnose, repair, or replace power window and power seat systems, including motors.
02.19 Diagnose, repair, or replace horn systems.
02.20 Diagnose, repair or replace clock systems.
02.21 Diagnose, repair, or replace warning buzzer.
02.22 Test and replace instrument panel units.
02.23 Service windshield wiper/washer systems.
02.24 Test and replace units.
02.25 Check, remove, and replace radios.

03.0 DEMONSTRATE PROFICIENCY IN STEERING, SUSPENSION, and WHEEL SERVICES--The student will be able to:

03.01 Diagnose abnormal tire wear problems.
03.02 Diagnose suspension problems.
03.03 Diagnose wheel/tire vibrations, shimmy, and tramp.
03.04 Diagnose steering problems.
03.05 Lubricate suspension, steering gear, and linkage.
03.06 Check manual steering gear fluid level.
03.07 Inspect steering systems.
03.08 Inspect suspension systems.
03.09 Inspect and test shock absorbers.
03.10 Check power steering fluid level.
03.11 Replace power steering drive belts.
03.12 Identify tires by types and sizes.
03.13 Inspect and service tires and wheels.
03.14 Repair tires.
03.15 Rotate wheels and tires.
03.16 Bubble balance wheels and tires.
03.17 Spin balance wheels and tires.
03.18 Service front wheel bearings and grease seals.
03.19 Remove and replace front wheel bearings.
03.20 Remove and replace spindles and ball joints.
03.21 Remove and replace shock absorbers and mountings.
03.23 Measure and adjust torsion bar height.
03.24 Remove and replace coil springs/torsion bars.
03.25 Remove and replace control arms and bushings.
03.26 Remove and replace steering linkage components.
03.27 Remove and replace steering dampers.
03.28 Remove and replace rear suspension parts.
03.29 Remove and replace steering assemblies.
03.30 Check 2-wheel and 4-wheel alignment.
03.31 Check 4-wheel alignment (optional for 1987 only).

04.0 DEMONSTRATE PROFICIENCY IN AUTOMOTIVE BRAKE SERVICE--The student will be able to:

04.01 Diagnose brake system problems.
04.02 Diagnose pressure differential valve malfunctions.
04.03 Diagnose proportioning valve malfunctions.
04.04 Diagnose metering valve malfunctions.
04.05 Check master cylinder fluid level.
04.06 Perform operational inspections.
04.07 Inspect brake and wheel assemblies.
04.08 Remove and replace calipers and rotors.
04.09 Refinish rotors.
04.10 Refinish calipers.
04.11 Refinish brake drums.
04.12 Replace drum brake shoes.
04.13 Adjust brake shoes.
04.14 Adjust parking brakes.
04.15 Rebuild wheel cylinders.
04.16 Remove and replace wheel cylinders.
04.17 Bleed hydraulic brakes.
04.18 Free up or replace parking brake cables and linkage.
04.19 Remove and replace master cylinders.
04.20 Flush brake systems.
04.21 Service and repair power assist and brake control systems.

05.0 DEMONSTRATE PROFICIENCY IN COOLING, AIR CONDITIONING, and HEATING SERVICE --The student will be able to:

05.01 Inspect, remove, and replace fan belts.
05.02 Check radiator coolant level.
05.03 Test and replace coolant.
05.04 Pressure test cooling systems.
05.05 Test radiator caps.
05.06 Inspect, remove, and replace radiator and heater hoses.
05.07 Remove, test, and replace thermostats.
05.08 Flush cooling systems.
05.09 Remove and replace radiators.
05.10 Remove and replace water pumps.
05.11 Diagnose basic air conditioning system problems.
05.12 Inspect and pressure test basic air conditioning systems.
05.13 Inspect, remove, and replace air conditioning belts.
05.14 Discharge, evacuate, and charge basic air conditioning systems.
05.15 Leak test basic air conditioning systems.
05.16 Service air conditioning electrical circuits.
05.17 Service vacuum circuits.
05.18 Remove and replace components in basic air conditioning systems.
05.19 Remove and replace engine fan clutches.
05.20 Service import air conditioning systems.
05.21 Remove and replace blower motors.
05.22 Remove and replace heater cores, control units, and cables.
05.23 Remove and replace compressor shaft seal.

06.0 DEMONSTRATE PROFICIENCY IN ENGINE PERFORMANCE SERVICE--The student will be able to:

06.01 Analyze engine performance.
06.02 Perform running cylinder balance tests.
06.03 Perform cylinder compression tests.
06.04 Check the performance of engines equipped with on-board computers.
06.05 Inspect, remove, and replace points and condensers.
06.06 Remove and replace distributors.
06.07 Check distributors using a distributor tester.
06.08 Check the distributor advance in a vehicle.
06.09 Overhaul distributors.
06.10 Inspect and test primary circuits.
06.11 Remove and replace coils.
06.12 Remove and replace ignition switches and resistors.
06.13 Inspect, remove, and replace ignition wires, caps, and rotors.
06.14 Remove and replace spark plugs.
06.15 Clean and gap spark plugs.
06.16 Perform cylinder leakage tests.

06.17 Service import electronic ignition systems.
06.18 Service GM high energy ignition systems.
06.19 Diagnose GM Computer Command Control (CCC) systems.
06.20 Service Chrysler electronic ignitions.
06.21 Service Chrysler oxygen feedback systems.
06.22 Service Ford solid state ignitions.
06.23 Service Ford EEC/MCU systems.
06.24 Service air cleaners.
06.25 Inspect, remove, and replace fuel filters.
06.26 Measure fuel flow and pressure.
06.27 Remove and replace fuel lines.
06.28 Remove and replace fuel pumps.
06.29 Adjust idle speed.
06.30 Adjust idle mixture: propane.
06.31 Clean and adjust chokes.
06.32 Clean and overhaul carburetors.
06.33 Inspect, remove, and replace manifold control valves.
06.34 Remove and replace turbochargers.
06.35 Check and adjust waste gates.
06.36 Remove and replace fuel injection system filters.
06.37 Set idle speed to specifications.
06.38 Remove and replace fuel injectors.
06.39 Service throttle body fuel injection systems.
06.40 Service ported fuel injection systems.
06.41 Service PCV systems.
06.42 Service evaporative control systems.
06.43 Service thermostatic air cleaners.
06.44 Service air injection systems.
06.45 Inspect, remove, and replace air-pump belts.
06.46 Service EGR systems.
06.47 Service ignition timing controls.
06.48 Test exhaust emissions using an HC/CO tester.
06.49 Remove and replace catalytic converter beads.
06.50 Service diesel injectors.
06.51 Remove and replace diesel engine fuel filters.
06.52 Check and adjust injection pump timing.
06.53 Remove and replace injection pumps.
06.54 Check and adjust idle and maximum speeds.
06.55 Test and service pre-heating systems.
06.56 Diagnose mechanical, ignition, and fuel emission problems.
06.57 Inspect exhaust systems.
06.58 Remove and replace tail pipes.
06.59 Remove and replace mufflers.
06.60 Remove and replace exhaust pipes.
06.61 Inspect, remove, and replace catalytic converters.

07.0 DEMONSTRATE PROFICIENCY IN AUTOMATIC TRANSMISSION/TRANS-AXLE SERVICE--The student will be able to:

07.01 Check automatic transmission fluid level.
07.02 Performance test automatic transmissions.
07.03 Diagnose malfunctions of automatic transmissions such as fluid leaks, fluid condition, slipping, lock-up, and shift problems.
07.04 Diagnose, repair, and replace trans-axles.
07.05 Pressure test transmissions in vehicles.
07.06 Stall test transmissions in vehicles.
07.07 Change transmission oil and filter.
07.08 Adjust linkage from the engine.
07.09 Adjust shift linkage.
07.10 Test the electrical controls of an automatic clutch converter.
07.11 Adjust neutral safety switches.
07.12 Remove and replace external gaskets and seals.
07.13 Test vacuum shift modulators.
07.14 Adjust bands.
07.15 Service governors.
07.16 Service valve bodies.
07.17 Rebuild transmission assemblies.
07.18 Pressure flush converter assemblies.
07.19 Pressure flush transmission cooler assemblies.
07.20 Remove and replace extension housings and bushings.

08.0 DEMONSTRATE PROFICIENCY IN SERVICING MANUAL DRIVE TRAINS AND AXLES--The student will be able to:

08.01 Diagnose drive line problems.
08.02 Diagnose and performance test manual transmission problems.
08.03 Inspect drive shafts, U-joints, and center bearings.
08.04 Lubricate universal joints.
08.05 Check the fluid level in a manual transmission.
08.06 Check the fluid level in a differential.
08.07 Remove and replace transmission mounts.
08.08 Remove and replace clutch assembly and linkage.
08.09 Adjust shift linkage.
08.10 Adjust clutches.
08.11 Remove and replace extension housing seals and bushings.
08.12 Rebuild manual transmissions, to include overdrives.
08.13 Remove and replace clutches, release bearings, linkage, and pilot bearings.
08.14 Rebuild clutch master and slave cylinders.
08.15 Remove and replace universal joints.
08.16 Remove and replace speedometer gears and service speedometer cables.
08.17 Remove and replace axle bearings and seals.
08.18 Overhaul integral differentials.
08.19 Overhaul removable differentials.
08.20 Overhaul limited slip differentials.
08.21 Overhaul trans-axle assemblies.
08.22 Adjust trans-axle shifting controls.
08.23 Inspect, remove, replace, and lubricate front-drive-axle flexible joints.
08.24 Inspect, remove, and replace constant velocity universal joints.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other employees.
09.07 Identify and adopt acceptable work habits.
09.08 Demonstrate knowledge of how to take job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education — COURSE CREDIT: 1

PROGRAM TITLE: Basic Automotive Mechanics — PROGRAM NUMBER: 8709100

COURSE TITLE: Basic Automotive Mechanics 1 — COURSE NUMBER: 8709110

COURSE DESCRIPTION:

This course is designed to provide an introduction to automotive mechanics. It will include instruction in safety procedures, use of hand tools, related math, bench skills, use of repair and service manuals and employability skills.

01.0 DEMONSTRATE BASIC KNOWLEDGE OF AUTOMOTIVE MECHANICS--The student will be able to:

01.01 Apply shop safety rules and procedures.
01.02 Use and maintain hand tools such as screwdrivers, special-application pliers, hammers, chisels, punches, special-application wrenches and sockets, files, hacksaws, bench vises, and c-clamps.
01.03 Demonstrate use of precision measuring tools.
01.04 Apply electrical safety rules and procedures.
01.05 Apply fire safety rules and procedures.
01.06 Apply basic welding skills related to the automobile industry.
01.07 Use and maintain power tools such as drills, bench grinders, drill presses, hydraulic presses, impact wrenches, air chisels, parts washers, hydraulic jacks, and vehicle hoists.
01.08 Use and apply basic electrical and electronic test equipment and meters.
01.09 Use and install fasteners such as screws and bolts, key screw. extractors, helicoil inserts, and thread cutting taps and dies.
01.10 Apply basic math skills.
01.11 Apply metric math skills.
01.12 Lubricate and service chassis.
01.13 Demonstrate use of multiple- and single-volume-type shop manuals.
01.14 Demonstrate use of specification handbooks and tuneup charts.
01.15 Demonstrate use of Motors, Chilton, Mitchell and other service manuals.
01.16 Understand electrical terms, magnetism, electrical current flow and Ohms' law, and sources.
01.17 Understand and apply the rules of series circuits.
01.18 Understand and apply the rules of parallel circuits.
01.19 Understand and apply the rules of series-parallel circuits.
01.20 Understand steering geometry and suspension geometry such as caster, camber, toe-in, kingpin inclination (steering axis), and toe-in and toe-out on turns.
01.21 Understand the function of steering and suspension system components such as coil springs, leaf springs, torsion bars, twin "I" beams, quadralink, rubber bushings, shock absorbers, tie rods, ball joints, shackles, idler arm, pitman arm, and control arm.
01.22 Understand manual and power steering operation--integral and linkage types--such as power steering pump, power steering control valve, and power steering fluid leaks.
01.23 Understand drum brake operation such as adjusters, wheel cylinder, pull, grab, chatter, noise, pulsations, fade, and lining conditions.
01.24 Understand disc brake operation such as caliper, piston, pull, grab, chatter, pulsations, fade, and lining conditions.
01.25 Understand brake system valve operation such as pressure. differential valve, proportional valve, metering valve, and brake warning light.
01.26 Understand pedal height.
01.27 Demonstrate an understanding of basic heating and cooling systems.
01.28 Understand basic air conditioning systems.
01.29 Demonstrate knowledge of engine component functions and driveability.
01.30 Understand basic ignition and fuel systems.
01.31 Understand rear axle operation such as differential action; limited slip mechanisms; floating, non-floating, and semi-floating.

01.32 Understand drive shaft operation, drive shaft construction, and universal joint operation such as single joint, constant velocity, joint working angle, joint phasing, slip joint joint, splined output, and splined drive shaft.
01.33 Understand automatic transmission operation such as fluid coupling, torque converter, plantary gear system, power flow, hydraulic system, lubricant, and cooling.
01.34 Understand clutch operation.
01.35 Understand clutch release mechanisms, to include linkage and hydraulic.
01.36 Understand manual transmission operation such as torque multiplication, power flow, sliding gears, constant mesh gear, synchronizer action, and shift mechanisms.
01.37 Understand overdrive operation.
01.38 Demonstrate knowledge of internal engine components.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education — COURSE CREDIT: 1
PROGRAM TITLE: Basic Automotive Mechanics — PROGRAM NUMBER: 8709100
COURSE TITLE: Basic Automotive Mechanics 2 — COURSE NUMBER: 8709120

COURSE DESCRIPTION:

This course is designed to provide instruction automotive electrical systems including diagnosing, troubleshooting and repair.

02.0 APPLY ELECTRICAL AND ELECTRONIC SKILLS IN DIAGNOSING/TROUBLESHOOTING MALFUNCTIONS OF ELECTRICAL/ELECTRONIC COMPONENTS (Computerized or Non-Computerized)

02.01 Diagnose engine malfunctions.
02.02 Perform power checks with test lights.
02.03 Perform continuity tests.
02.04 Measure voltage drop, current flow, and resistance in a circuit or component with a multimeter.
02.05 Locate an open circuit or a short circuit.
02.06 Analyze cranking system malfunctions.
02.07 Analyze charging system malfunctions.
02.08 Service and test batteries.
02.09 Remove and replace light bulbs.
02.10 Inspect, remove, and replace alternator belts.
02.11 Test, remove, and replace fuses and circuit breakers.
02.12 Replace and test starters.
02.13 Test and overhaul alternators.
02.14 Remove and replace regulators.
02.15 Inspect and repair lighting systems.
02.16 Diagnose, repair or replace turn signal and stoplight switches.
02.17 Test and replace electrical system switches.
02.18 Diagnose, repair, or replace power window and power seat systems, including motors.
02.19 Diagnose, repair, or replace horn systems.
02.20 Diagnose, repair or replace clock systems.
02.21 Diagnose, repair, or replace warning buzzer.
02.22 Test and replace instrument panel units.
02.23 Service windshield wiper/washer systems.
02.24 Test and replace units.
02.25 Check, remove, and replace radios.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education — COURSE CREDIT: 1
PROGRAM TITLE: Basic Automotive Mechanics — PROGRAM NUMBER: 8709100
COURSE TITLE: Basic Automotive Mechanics 3 — COURSE NUMBER: 8709130

COURSE DESCRIPTION:

This course is designed to provide instruction in automotive suspension, steering alignment and balance.

03.0 DEMONSTRATE PROFICIENCY IN STEERING, SUSPENSION, and WHEEL SERVICES--The student will be able to:

03.01 Diagnose abnormal tire wear problems.
03.02 Diagnose suspension problems.
03.03 Diagnose wheel/tire vibrations, shimmy, and tramp.
03.04 Diagnose steering problems.
03.05 Lubricate suspension, steering gear, and linkage.
03.06 Check manual steering gear fluid level.
03.07 Inspect steering systems.
03.08 Inspect suspension systems.
03.09 Inspect and test shock absorbers.
03.10 Check power steering fluid level.
03.11 Replace power steering drive belts.
03.12 Identify tires by types and sizes.
03.13 Inspect and service tires and wheels.
03.14 Repair tires.
03.15 Rotate wheels and tires.
03.16 Bubble balance wheels and tires.
03.17 Spin balance wheels and tires.
03.18 Service front wheel bearings and grease seals.
03.19 Remove and replace front wheel bearings.
03.20 Remove and replace spindles and ball joints.
03.21 Remove and replace shock absorbers and mountings.
03.23 Measure and adjust torsion bar height.
03.24 Remove and replace coil springs/torsion bars.
03.25 Remove and replace control arms and bushings.
03.26 Remove and replace steering linkage components.
03.27 Remove and replace steering dampers.
03.28 Remove and replace rear suspension parts.
03.29 Remove and replace steering assemblies.
03.30 Check 2-wheel and 4-wheel alignment.
03.31 Check 4-wheel alignment (optional for 1987 only).

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education
COURSE CREDIT: 1

PROGRAM TITLE: Basic Automotive Mechanics
PROGRAM NUMBER: 8709100

COURSE TITLE: Basic Automotive Mechanics 4
COURSE NUMBER: 8709140

COURSE DESCRIPTION:

This course is designed to provide instruction in automotive brakes.

04.0 DEMONSTRATE PROFICIENCY IN AUTOMOTIVE BRAKE SERVICE

04.01 Diagnose brake system problems.
04.02 Diagnose pressure differential valve malfunctions.
04.03 Diagnose proportioning valve malfunctions.
04.04 Diagnose metering valve malfunctions.
04.05 Check master cylinder fluid level.
04.06 Perform operational inspections.
04.07 Inspect brake and wheel assemblies.
04.08 Remove and replace calipers and rotors.
04.09 Refinish rotors.
04.10 Refinish calipers.
04.11 Refinish brake drums.
04.12 Replace drum brake shoes.
04.13 Adjust brake shoes.
04.14 Adjust parking brakes.
04.15 Rebuild wheel cylinders.
04.16 Remove and replace wheel cylinders.
04.17 Bleed hydraulic brakes.
04.18 Free up or replace parking brake cables and linkage.

04.19 Remove and replace master cylinders.
04.20 Flush brake systems.
04.21 Service and repair power assist and brake control systems.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Basic Automotive Mechanics PROGRAM NUMBER: 8709100

COURSE TITLE: Basic Automotive Mechanics 5 COURSE NUMBER: 8709150

COURSE DESCRIPTION:

This course is designed to provide instruction in automotive cooling, air conditioning and heating sytems.

05.0 DEMONSTRATE PROFICIENCY IN COOLING, AIR CONDITIONING, and HEATING SERVICE

05.01 Inspect, remove, and replace fan belts.
05.02 Check radiator coolant level.
05.03 Test and replace coolant.
05.04 Pressure test cooling systems.
05.05 Test radiator caps.
05.06 Inspect, remove, and replace radiator and heater hoses.
05.07 Remove, test, and replace thermostats.
05.08 Flush cooling systems.
05.09 Remove and replace radiators.
05.10 Remove and replace water pumps.
05.11 Diagnose basic air conditioning system problems.
05.12 Inspect and pressure test basic air conditioning systems.
05.13 Inspect, remove, and replace air conditioning belts.
05.14 Discharge, evacuate, and charge basic air conditioning systems.
05.15 Leak test basic air conditioning systems.
05.16 Service air conditioning electrical circuits.
05.17 Service vacuum circuits.
05.18 Remove and replace components in basic air conditioning systems.
05.19 Remove and replace engine fan clutches.
05.20 Service import air conditioning systems.
05.21 Remove and replace blower motors.
05.22 Remove and replace heater cores, control units, and cables.
05.23 Remove and replace compressor shaft seal.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Basic Automotive Mechanics PROGRAM NUMBER: 8709100

COURSE TITLE: Basic Automotive Mechanics 6 COURSE NUMBER: 8709160

COURSE DESCRIPTION:

This course will provide instruction in engine performance service, manual tran service, automatic transmission service as well as employability skills and entrepreneurship.

06.0 DEMONSTRATE PROFICIENCY IN ENGINE PERFORMANCE SERVICE--The student will be able to:

06.01 Analyze engine performance.
06.02 Perform running cylinder balance tests.
06.03 Perform cylinder compression tests.
06.04 Check the performance of engines equipped with on-board computers.
06.05 Inspect, remove, and replace points and condensers.
06.06 Remove and replace distributors.
06.07 Check distributors using a distributor tester.
06.08 Check the distributor advance in a vehicle.

06.09 Overhaul distributors.
06.10 Inspect and test primary circuits.
06.11 Remove and replace coils.
06.12 Remove and replace ignition switches and resistors.
06.13 Inspect, remove, and replace ignition wires, caps, and rotors.
06.14 Remove and replace spark plugs.
06.15 Clean and gap spark plugs.
06.16 Perform cylinder leakage tests.
06.17 Service import electronic ignition systems.
06.18 Service GM high energy ignition systems.
06.19 Diagnose GM Computer Command Control (CCC) systems.
06.20 Service Chrysler electronic ignitions.
06.21 Service Chrysler oxygen feedback systems.
06.22 Service Ford solid state ignitions.
06.23 Service Ford EEC/MCU systems.
06.24 Service air cleaners.
06.25 Inspect, remove, and replace fuel filters.
06.26 Measure fuel flow and pressure.
06.27 Remove and replace fuel lines.
06.28 Remove and replace fuel pumps.
06.29 Adjust idle speed.
06.30 Adjust idle mixture: propane.
06.31 Clean and adjust chokes.
06.32 Clean and overhaul carburetors.
06.33 Inspect, remove, and replace manifold control valves.
06.34 Remove and replace turbochargers.
06.35 Check and adjust waste gates.
06.36 Remove and replace fuel injection system filters.
06.37 Set idle speed to specifications.
06.38 Remove and replace fuel injectors.
06.39 Service throttle body fuel injection systems.
06.40 Service ported fuel injection systems.
06.41 Service PCV systems.
06.42 Service evaporative control systems.
06.43 Service thermostatic air cleaners.
06.44 Service air injection systems.
06.45 Inspect, remove, and replace air-pump belts.
06.46 Service EGR systems.
06.47 Service ignition timing controls.
06.48 Test exhaust emissions using an HC/CO tester.
06.49 Remove and replace catalytic converter beads.
06.50 Service diesel injectors.
06.51 Remove and replace diesel engine fuel filters.
06.52 Check and adjust injection pump timing.
06.53 Remove and replace injection pumps.
06.54 Check and adjust idle and maximum speeds.
06.55 Test and service pre-heating systems.
06.56 Diagnose mechanical, ignition, and fuel emission problems.
06.57 Inspect exhaust systems.
06.58 Remove and replace tail pipes.
06.59 Remove and replace mufflers.
06.60 Remove and replace exhaust pipes.
06.61 Inspect, remove, and replace catalytic converters.

07.0 DEMONSTRATE PROFICIENCY IN AUTOMATIC TRANSMISSION/TRANS-AXLE SERVICE--The student will be able to:

07.01 Check automatic transmission fluid level.
07.02 Performance test automatic transmissions.
07.03 Diagnose malfunctions of automatic transmissions such as fluid leaks, fluid condition, slipping, lock-up, and shift problems.
07.04 Diagnose, repair, and replace trans-axles.
07.05 Pressure test transmissions in vehicles.
07.06 Stall test transmissions in vehicles.
07.07 Change transmission oil and filter.
07.08 Adjust linkage from the engine.
07.09 Adjust shift linkage.
07.10 Test the electrical controls of an automatic clutch converter.
07.11 Adjust neutral safety switches.
07.12 Remove and replace external gaskets and seals.
07.13 Test vacuum shift modulators.
07.14 Adjust bands.

07.15 Service governors.
07.16 Service valve bodies.
07.17 Rebuild transmission assemblies.
07.18 Pressure flush converter assemblies.
07.19 Pressure flush transmission cooler assemblies.
07.20 Remove and replace extension housings and bushings.

08.0 DEMONSTRATE PROFICIENCY IN SERVICING MANUAL DRIVE TRAINS & AXLES--The student will be able to:

08.01 Diagnose drive line problems.
08.02 Diagnose and performance test manual transmission problems.
08.03 Inspect drive shafts, U-joints, and center bearings.
08.04 Lubricate universal joints.
08.05 Check the fluid level in a manual transmission.
08.06 Check the fluid level in a differential.
08.07 Remove and replace transmission mounts.
08.08 Remove and replace clutch assembly and linkage.
08.09 Adjust shift linkage.
08.10 Adjust clutches.
08.11 Remove and replace extension housing seals and bushings.
08.12 Rebuild manual transmissions, to include overdrives.
08.13 Remove and replace clutches, release bearings, linkage, and pilot bearings.
08.14 Rebuild clutch master and slave cylinders.
08.15 Remove and replace universal joints.
08.16 Remove and replace speedometer gears and service speedometer cables.
08.17 Remove and replace axle bearings and seals.
08.18 Overhaul integral differentials.
08.19 Overhaul removable differentials.
08.20 Overhaul limited slip differentials.
08.21 Overhaul trans-axle assemblies.
08.22 Adjust trans-axle shifting controls.
08.23 Inspect, remove, replace, and lubricate front-drive-axle flexible joints.
08.24 Inspect, remove, and replace constant velocity universal joints.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other employees.
09.07 Identify and adopt acceptable work habits.
09.08 Demonstrate knowledge of how to take job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial
FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987
PROGRAM TITLE: Basic Boatbuilding - Wood and Fabricated
CODE NUMBER: Secondary 8721000 Postsecondary ______
Florida CIP IN48.079902

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational
______ Postsecondary Vocational x Other 10-12, 21

CERTIFICATION COVERAGE: CAB WOODWK 7 CARPENTRY 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as shipfitters (50143400), shipriggers (50144812), boat patchers, plaster (61088615), or boatbuilders (860.381-018).

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, use of fiberglass and marine woodworking skills, frame building, painting and installation of hardware and simple electrical and mechanical systems. A program may be structured to emphasize either wood or fabricated boatbuilding but does not have to cover both areas comprehensively.

Listed below are the courses that comprise this program when offered at the secondary level:

8721010	Basic Boatbuilding - Wood and Fabricated 1
8721020	Basic Boatbuilding - Wood and Fabricated 2
8721030	Basic Boatbuilding - Wood and Fabricated 3
8721040	Basic Boatbuilding - Wood and Fabricated 4
8721050	Basic Boatbuilding - Wood and Fabricated 5
8721060	Basic Boatbuilding - Wood and Fabricated 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in fiberglass lamination and fabrication, gelcoat repair, boat woodworking operations, painting and servicing basic systems in a boatyard manufacturing or refurbishing environment.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply trade accepted terminology and safety.
02. Perform hand lamination operations.
03. Repair gelcoat.
04. Perform framing operations.
05. Perform trim operations.
06. Install and service mechanical systems.
07. Install wiring.
08. Perform fiberglass fabrication operations.
09. Perform assembly woodworking operations.
10. Construct molds.
11. Repair fiberglass.
12. Apply paint.
13. Repair wooden boats.
14. Service piping/wiring systems.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
SECONDARY NUMBER: 8721000

PROGRAM TITLE: Basic Boatbuilding - Wood and Fabricated
POSTSECONDARY NUMBER: ________

01.0 APPLY TRADE ACCEPTED TERMINOLOGY AND SAFETY--The student will be able to:

01.01 Use curriculum modules.
01.02 Use work schedule and progress chart.
01.03 Use marine and technical terminology.
01.04 Apply shop safety rules.

02.0 PERFORM HAND LAMINATION--The student will be able to:

02.01 Identify tools and materials and precautions.
02.02 Lay up mat laminates.
02.03 Lay up woven laminates.
02.04 Lay up directional laminates.
02.05 Apply reinforced structural bonds.
02.06 Cut and grind laminates to specifications.

03.0 REPAIR GELCOAT--The student will be able to:

03.01 Identify tools, materials and precautions.
03.02 Sand and buff gelcoat.
03.03 Repair gelcoat with putty.
03.04 Repair gelcoat with spray equipment.

04.0 PERFORM FRAMING OPERATIONS--The student will be able to:

04.01 Use frame plans and tools.
04.02 Layout dimensions from plans.
04.03 Fit bulkheads.
04.04 Fit faces and tops.

05.0 PERFORM TRIM OPERATIONS--The student will be able to:

05.01 Identify tools and precautions.
05.02 Identify and apply flat trim moldings.
05.03 Identify and apply cap and corner moldings.
05.04 Hang compartment door.
05.05 Install hull-side paneling.
05.06 Install cabinet doors and drawers.

06.0 INSTALL AND SERVICE MECHANICAL SYSTEMS--The student will be able to:

06.01 Identify tools and precautions.
06.02 Perform routine engine service.
06.03 Maintain mechanical steering.
06.04 Repair rigging.
06.05 Install deck hardware.

07.0 INSTALL WIRING SYSTEMS--The student will be able to:

07.01 Identify tools, materials, and precautions.
07.02 Install batteries.
07.03 Select DC conductor size.
07.04 Install DC lighting.

08.0 PERFORM FIBERGLASS FABRICATION OPERATIONS--The student will be able to:

08.01 Operate chop gun.
08.02 Prepare and apply bonding putty.
08.03 Identify and apply core materials.
08.04 Fabricate parts by vacuum molding.
08.05 Prepare mold for gelcoat.
08.06 Operate gel gun.
08.07 Pull parts.
08.08 Repair molds.
08.09 Maintain molds.

09.0 PERFORM ASSEMBLY WOODWORK--The student will be able to:

09.01 Level hull and set up cross beams.
09.02 Fabricate and install sub-sole components.
09.03 Fabricate and install sole.
09.04 Construct router, shaper, and tracing patterns.
09.05 Cut bulkheads from patterns.
09.06 Construct straight moldings and posts.
09.07 Construct turn corner moldings and posts.
09.08 Construct solid and laminated curved moldings.

10.0 CONSTRUCT MOLDS--The student will be able to:

10.01 Prepare plug for mold lamination.
10.02 Gel and skin mold.
10.03 Laminate mold.
10.04 Brace and pull mold.
10.05 Prepare mold for first use.

11.0 REPAIR FIBERGLASS--The student will be able to:

11.01 Install point loads and stiffeners.
11.02 Repair laminates.
11.03 Renew bottom paint.

12.0 APPLY PAINT--The student will be able to:

12.01 Identify materials and precautions.
12.02 Repair/prepare surface.
12.03 Apply and prepare primer.
12.04 Apply masking and pull tapes.
12.05 Apply paint with spray equipment.

13.0 REPAIR BOATS--The student will be able to:

13.01 Identify wooden boat construction type.
13.02 Repair plank-on-frames construction.
13.03 Use epoxy resin in restoration/repair.
13.04 Maintain wooden boats.

14.0 SERVICE PIPING/WIRING SYSTEMS--The student will be able to:

14.01 Maintain fuel systems.
14.02 Maintain sewage systems.
14.03 Troubleshoot DC systems.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job interview.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Basic Boatbuilding - Wood and Fabricated
PROGRAM NUMBER: 8721000
COURSE TITLE: Basic Boatbuilding - Wood and Fabricated 1
COURSE NUMBER: 8721010

COURSE DESCRIPTION:

This course is designed to provide an introduction of the related trade terminology, safety rules and regulation, communication and human relation skills.

01.0 APPLY TRADE ACCEPTED TERMINOLOGY AND SAFETY--The student will be able to:

01.01 Use curriculum modules.
01.02 Use work schedule and progress chart.
01.03 Use marine and technical terminology.
01.04 Apply shop safety rules.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job interview.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Basic Boatbuilding - Wood and Fabricated
PROGRAM NUMBER: 8721000
COURSE TITLE: Basic Boatbuilding - Wood and Fabricated 2
COURSE NUMBER: 8721020

COURSE DESCRIPTION:

This course is designed to provide instruction in the operations of hand laminating framing and assembling wood working operations.

04.0 PERFORM FRAMING OPERATIONS--The student will be able to:

04.01 Use frame plans and tools.
04.02 Layout dimensions from plans.
04.03 Fit bulkheads.
04.04 Fit faces and tops.

09.0 PERFORM ASSEMBLY WOODWORK--The student will be able to:

09.01 Level hull and set up cross beams.
09.02 Fabricate and install sub-sole components.
09.03 Fabricate and install sole.
09.04 Construct router, shaper, and tracing patterns.
09.05 Cut bulkheads from patterns.
09.06 Construct straight moldings and posts.
09.07 Construct turn corner moldings and posts.
09.08 Construct solid and laminated curved moldings.

02.0 PERFORM HAND LAMINATION--The student will be able to:

02.01 Identify tools and materials and precautions.
02.02 Lay up mat laminates.
02.03 Lay up woven laminates.
02.04 Lay up directional laminates.
02.05 Apply reinforced structural bonds.
02.06 Cut and grind laminates to specifications.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Basic Boatbuilding - Wood and Fabricated — PROGRAM NUMBER: 8721000

COURSE TITLE: Basic Boatbuilding - Wood and Fabricated 3 — COURSE NUMBER: 8721030

COURSE DESCRIPTION:

This course is designed to provide instruction in the techniques of constructing and using a mold for fiberglass fabrication.

10.0 CONSTRUCT MOLDS--The student will be able to:

10.01 Prepare plug for mold lamination.
10.02 Gel and skin mold.
10.03 Laminate mold.
10.04 Brace and pull mold.
10.05 Prepare mold for first use.

08.0 PERFORM FIBERGLASS FABRICATION OPERATIONS--The student will be able to:

08.01 Operate chop gun.
08.02 Prepare and apply bonding putty.
08.03 Identify and apply core materials.
08.04 Fabricate parts by vacuum molding.
08.05 Prepare mold for gelcoat.
08.06 Operate gel gun.
08.07 Pull parts.
08.08 Repair molds.
08.09 Maintain molds.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Basic Boatbuilding - Wood and Fabricated — PROGRAM NUMBER: 8721000

COURSE TITLE: Basic Boatbuilding - Wood and Fabricated 4 — COURSE NUMBER: 8721040

COURSE DESCRIPTION:

This course is designed to provide instruction in the application of trims, and required hard ware, pointing application an the servicing of the mechanical system.

05.0 PERFORM TRIM OPERATIONS--The student will be able to:

05.01 Identify tools and precautions.
05.02 Identify and apply flat trim moldings.
05.03 Identify and apply cap and corner moldings.
05.04 Hang compartment door.
05.05 Install hull-side paneling.
05.06 Install cabinet doors and drawers.

06.0 INSTALL AND SERVICE MECHANICAL SYSTEMS--The student will be able to:

06.01 Identify tools and precautions.
06.02 Perform routine engine service.
06.03 Maintain mechanical steering.
06.04 Repair rigging.
06.05 Install deck hardware.

12.0 APPLY PAINT--The student will be able to:

12.01 Identify materials and precautions.
12.02 Repair/prepare surface.
12.03 Apply and prepare primer.
12.04 Apply masking and pull tapes.
12.05 Apply paint with spray equipment.

STUDENT PERFORMANCE STANDARDS	EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial	COURSE CREDIT: 1
PROGRAM TITLE: Basic Boatbuilding - Wood and Fabricated	PROGRAM NUMBER: 8721000
COURSE TITLE: Basic Boatbuilding - Wood and Fabricated 5	COURSE NUMBER: 8721050

COURSE DESCRIPTION:

This course is designed to provide instruction in the installation of the wiring and piping systems of boatbuilding and repairing.

07.0 INSTALL WIRING SYSTEMS--The student will be able to:

07.01 Identify tools, materials, and precautions.
07.02 Install batteries.
07.03 Select DC conductor size.
07.04 Install DC lighting.

14.0 SERVICE PIPING/WIRING SYSTEMS--The student will be able to:

14.01 Maintain fuel systems.
14.02 Maintain sewage systems.
14.03 Troubleshoot DC systems.

STUDENT PERFORMANCE STANDARDS	EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial	COURSE CREDIT: 1
PROGRAM TITLE: Basic Boatbuilding - Wood and Fabricated	PROGRAM NUMBER: 8721000
COURSE TITLE: Basic Boatbuilding - Wood and Fabricated 6	COURSE NUMBER: 8721060

COURSE DESCRIPTION:

This course is designed to provide instruction in the tools, methods and techniques of boat maintenance repairing of gelcoat, fiberglass wood and metal boat repair.

03.0 REPAIR GELCOAT--The student will be able to:

- 03.01 Identify tools, materials and precautions.
- 03.02 Sand and buff gelcoat.
- 03.03 Repair gelcoat with putty.
- 03.04 Repair gelcoat with spray equipment.

11.0 REPAIR FIBERGLASS--The student will be able to:

- 11.01 Install point loads and stiffeners.
- 11.02 Repair laminates.
- 11.03 Renew bottom paint.

13.0 REPAIR BOATS--The student will be able to:

- 13.01 Identify wooden boat construction type.
- 13.02 Repair plank-on-frames construction.
- 13.03 Use epoxy resin in restoration/repair.
- 13.04 Maintain wooden boats.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Basic Cabinet Making, Millwork, and Furniture Making

CODE NUMBER: Secondary 8721100 Postsecondary ______

Florida CIP IN48.072300

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ______7-9 ______9-12 ______Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 10-12, 21

CERTIFICATION COVERAGE: CAB WOODWK 7 CARPENTRY 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as cabinetmakers (660.280-010), patternmakers (661.281-022), furniture assemblers (763.684-038).

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, planning, designing, and construction of casework, fixtures, millwork, and furniture.

Listed below are the courses that comprise this program when offered at the secondary level:

8721110	Basic Cabinet Making, Millwork, and Furniture Making 1
8721120	Basic Cabinet Making, Millwork, and Furniture Making 2
8721130	Basic Cabinet Making, Millwork, and Furniture Making 3
8721140	Basic Cabinet Making, Millwork, and Furniture Making 4
8721150	Basic Cabinet Making, Millwork, and Furniture Making 5
8721160	Basic Cabinet Making, Millwork, and Furniture Making 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in use of wood shaping and cutting equipment, and the building and finishing of casework and furniture.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Identify cabinets and furniture designs.
02. Apply basic shop skills.
03. Operate woodworking power equipment.
04. Design cabinets and furniture.
05. Estimate and order materials and supplies.

06. Construct and install cabinets.
07. Construct furniture.
08. Apply laminates.
09. Produce millwork.
10. Apply finishing skills.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial SECONDARY NUMBER: 8721100

PROGRAM TITLE: Basic Cabinetmaking, Millwork and Furniture Making POSTSECONDARY NUMBER: ______

01.0 IDENTIFY CABINETS AND FURNITURE DESIGN--The student will be able to:

01.01 Identify furniture and cabinet designs.
01.02 Identify characteristics of woods and their applications.

02.0 APPLY BASIC SHOP SKILLS--The student will be able to:

02.01 Apply communications skills.
02.02 Apply human relations skills.
02.03 Apply safety practices.
02.04 Apply math skills.
02.05 Apply measuring skills.
02.06 Use hand tools.
02.07 Identify types of fasteners.
02.08 Apply drilling and boring skills.
02.09 Apply sanding skills.
02.10 Apply joinery skills.
02.11 Make common wood joints.
02.12 Apply gluing and clamping skills.
02.13 Apply bending and laminating skills.
02.14 Apply plastic and laminating skills.
02.15 Apply veneering and inlaying skills.
02.16 Maintain tools and equipment.

03.0 OPERATE WOODWORKING POWER EQUIPMENT--The student will be able to:

03.01 Operate a circular saw.
03.02 Operate a saber saw.
03.03 Operate a drill.
03.04 Operate a power screwdriver.
03.05 Operate power planes.
03.06 Operate a router.
03.07 Operate a sander.
03.08 Operate staplers and nailers.
03.09 Operate a table saw.
03.10 Operate a radial arm saw.
03.11 Operate a drill and drill press.
03.12 Operate a jointer and planer.
03.13 Operate a band saw.
03.14 Operate a router and shaper.
03.15 Operate a power miter box.
03.16 Operate a scroll saw.
03.17 Operate a mortiser.
03.18 Operate a tenoner.
03.19 Operate a sanding machine.
03.20 Operate a wood lathe.
03.21 Operate staplers and nailers.

04.0 DESIGN CABINETS AND FURNITURE--The student will be able to:

04.01 Read blueprints.
04.02 Make shop drawings.
04.03 Determine standard dimensions of kitchen cabinets.
04.04 Select furniture dimensions using good design principles.
04.05 Prepare materials for cutting to minimize waste.
04.06 Select furniture plan or print.

05.0 ESTIMATE AND ORDER MATERIALS AND SUPPLIES--The student will be able to:

05.01 Determine materials and supplies according to plans.
05.02 Convert plywood stock to square footage.
05.03 Convert lumber stock to board footage.
05.04 Prepare materials estimate.
05.05 Prepare order for materials and supplies.

06.0 CONSTRUCT AND INSTALL CABINETS--The student will be able to:

06.01 Select cabinet plan or print.
06.02 Make a rod lay out.
06.03 Rough cut cabinet parts.
06.04 Net cut cabinet parts.
06.05 Perform machining information.

06.06 Construct joints.
06.07 Sand cabinet components.
06.08 Assemble cabinets.
06.09 Install cabinets.

07.0 CONSTRUCT FURNITURE--The student will be able to:

07.01 Select furniture plan or print.
07.02 Rough cut furniture parts.
07.03 Net cut furniture parts.
07.04 Perform machining operations.
07.05 Construct joints.
07.06 Sand furniture components.
07.07 Assemble furniture.
07.08 Apply finish.

08.0 APPLY LAMINATES--The student will be able to:

08.01 Select proper underlayment.
08.02 Select grade an thickness of laminate.
08.03 Layout laminate for cutting to eliminate waste.
08.04 Select laminate cutter.
08.05 Select material for banding.
08.06 Cut laminates to size.
08.07 Apply contact cement.
08.08 Bend plastics.
08.09 Perform finishing operations.

09.0 PRODUCE MILLWORK--The student will be able to:

09.01 Make a door jamb.
09.02 Make a window frame.
09.03 Make stairway parts.

10.0 APPLY FINISHING SKILLS--The student will be able to:

10.01 Identify finishing operations.
10.02 Fill, sand and stain cabinets and furniture.
10.03 Apply protection coatings.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS　　EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial　　COURSE CREDIT: 1

PROGRAM TITLE: Basic Cabinetmaking, Millwork and Furniture Making　　PROGRAM NUMBER: 8721100

COURSE TITLE: Basic Cabinetmaking, Millwork and Furniture Making 1　　COURSE NUMBER: 8721110

COURSE DESCRIPTION:

This course is designed to provide instruction of safety rules and regulations concerning tools, equipment, and class procedures, the identification of furniture, cabinet designs, characteristics of wood and their applications, communication and human relation skills, related math skills, use of measuring skills, methods of cutting, bending, fastening, joining and sanding of materials, and proper use of hand tools and power equipment.

01.0 IDENTIFY CABINETS AND FURNITURE DESIGN--The student will be able to:

01.01 Identify furniture and cabinet designs.
01.02 Identify characteristics of woods and their applications.

02.0 APPLY BASIC SHOP SKILLS--The student will be able to:

02.01 Apply communications skills.
02.02 Apply human relations skills.
02.03 Apply safety practices.
02.04 Apply math skills.
02.05 Apply measuring skills.
02.06 Use hand tools.
02.07 Identify types of fasteners.
02.08 Apply drilling and boring skills.
02.09 Apply sanding skills.
02.10 Apply joinery skills.
02.11 Make common wood joints.
02.12 Apply gluing and clamping skills.
02.16 Maintain tools and equipment.

03.0 OPERATE WOODWORKING POWER EQUIPMENT--The student will be able to:

03.01 Operate a circular saw.
03.02 Operate a saber saw.
03.03 Operate a drill.
03.04 Operate a power screwdriver.
03.05 Operate power planes.
03.06 Operate a router.
03.07 Operate a sander.
03.08 Operate staplers and nailers.
03.09 Operate a table saw.
03.10 Operate a radial arm saw.
03.11 Operate a drill and drill press.
03.12 Operate a jointer and planer.
03.13 Operate a band saw.
03.14 Operate a router and shaper.
03.15 Operate a power miter box.
03.16 Operate a scroll saw.
03.17 Operate a mortiser.
03.18 Operate a tenoner.
03.19 Operate a sanding machine.
03.20 Operate a wood lathe.
03.21 Operate staplers and nailers.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Basic Cabinetmaking, Millwork and Furniture Making — PROGRAM NUMBER: 8721100

COURSE TITLE: Basic Cabinetmaking, Millwork and Furniture Making 2 — COURSE NUMBER: 8721120

COURSE DESCRIPTION:

This course is designed to provide instruction in cabinet and furniture design, reading and interpreting blueprints and schematics, estimating and ordering materials and supplies, plan selection and cutting of materials.

04.0 DESIGN CABINETS AND FURNITURE--The student will be able to:

04.01 Read blueprints.
04.02 Make shop drawings.
04.03 Determine standard dimensions of kitchen cabinets.
04.04 Select furniture dimensions using good design principles.
04.05 Prepare materials for cutting to minimize waste.
04.06 Select furniture plan or print.

05.0 ESTIMATE AND ORDER MATERIALS AND SUPPLIES--The student will be able to:

05.01 Determine materials and supplies according to plans.
05.02 Convert plywood stock to square footage.
05.03 Convert lumber stock to board footage.
05.04 Prepare materials estimate.
05.05 Prepare order for materials and supplies.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Basic Cabinetmaking, Millwork and Furniture Making — PROGRAM NUMBER: 8721100

COURSE TITLE: Basic Cabinetmaking, Millwork and Furniture Making 3 — COURSE NUMBER: 8721130

COURSE DESCRIPTION:

This course is designed to provide instruction in cabinet construction techniques, finishing and installation of finished cabinet systems.

06.0 CONSTRUCT AND INSTALL CABINETS--The student will be able to:

06.01 Select cabinet plan or print.
06.02 Make a rod lay out.
06.03 Rough cut cabinet parts.
06.04 Net cut cabinet parts.
06.05 Perform machining information.
06.06 Construct joints.
06.07 Sand cabinet components.
06.08 Assemble cabinets.
06.09 Install cabinets.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Cabinetmaking, Millwork and Furniture Making PROGRAM NUMBER: 8721100

COURSE TITLE: Basic Cabinetmaking, Millwork and Furniture Making 4 COURSE NUMBER: 8721140

COURSE DESCRIPTION:

This course is designed to provide instruction in the selection of furniture plans, rough cutting, and machining operations of furniture parts, construction of wood joints, sanding, staining, and finishing of furniture with protective coating.

07.0 CONSTRUCT FURNITURE--The student will be able to:

07.01 Select furniture plan or print.
07.02 Rough cut furniture parts.
07.03 Net cut furniture parts.
07.04 Perform machining operations.
07.05 Construct joints.
07.06 Sand furniture components.
07.07 Assemble furniture.
07.08 Apply finish.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Cabinetmaking, Millwork and Furniture Making PROGRAM NUMBER: 8721100

COURSE TITLE: Basic Cabinetmaking, Millwork and Furniture Making 5 COURSE NUMBER: 8721150

COURSE DESCRIPTION:

This course is designed to provide instruction in the identification of cabinet and furniture veneers and plastic laminates, the methods of layout, cutting, bending and application of veneers and laminates used in cabinetmaking.

08.0 APPLY LAMINATES--The student will be able to:

08.01 Select proper underlayment.
08.02 Select grade and thickness of laminate.
08.03 Layout laminate for cutting to eliminate waste.
08.04 Select laminate cutter to eliminate waste.
08.05 Select material for banding.
08.06 Cut laminates to size.
08.07 Apply contact cement.
08.08 Bend plastics.
08.09 Perform finishing operations.
02.13 Apply bending and laminating skills.
02.14 Apply plastic laminating skills.
02.15 Apply veneering and inlaying skills.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Cabinetmaking, Millwork and Furniture Making PROGRAM NUMBER: 8721100

COURSE TITLE: Basic Cabinetmaking, Millwork and Furniture Making 6 COURSE NUMBER: 8721160

COURSE DESCRIPTION:

This course is designed to provide instruction in production millwork, applied finishing skills and employability skills.

09.0 PRODUCE MILLWORK--The student will be able to:

09.01 Make a door jamb.
09.02 Make a window frame.
09.03 Make stairway parts.

10.0 APPLY FINISHING SKILLS--The student will be able to:

10.01 Identify finishing operations.
10.02 Fill, sand and stain cabinets and furniture.
10.03 Apply protection coatings.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK — PROGRAM AREA: Industrial Education

FLORIDA DEPARTMENT OF EDUCATION — EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Basic Commercial Art

CODE NUMBER: Secondary 8718000 — Postsecondary ____________

Florida CIP IN48.022300

SECONDARY SCHOOL CREDITS 6 — COLLEGE CREDITS ____ — POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

_____ Postsecondary Vocational _x_ Other 10-12, 21

CERTIFICATION COVERAGE: COMM ART 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as commercial artists (10221601), illustrators (141.061.022), commercial designers (141.061.014), printmakers (144.061-014), air brush artists (970.281-010), layout formers (970.381-018), or letterers (970.661-014).

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, graphic production, technical art skills, design skills, lettering skills, typography, layout and paste-up skills, illustration skills, applied design, and air brush skills.

Listed below are the courses that comprise this program when offered at the secondary level:

8718010	Basic Commercial Art 1
8718020	Basic Commercial Art 2
8718030	Basic Commercial Art 3
8718040	Basic Commercial Art 4
8718050	Basic Commercial Art 5
8718060	Basic Commercial Art 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in techniques and media, use of tools, equipment, and supplies, paste-ups and mechanicals, typography, lettering, layout, illustration, and--if equipment is available and time allows--photography, development of air brush skills, and computer graphics.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communications, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job in-school learning experiences; a work station which reflects equipment, skills, and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the students' individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in communication skills.
02. Demonstrate proficiency in graphic production skills.
03. Demonstrate proficiency in technical art skills.
04. Demonstrate proficiency in design skills.
05. Demonstrate proficiency in lettering skills.
06. Demonstrate proficiency in typography skills.
07. Demonstrate proficiency in layout and paste-up skills.
08. Demonstrate proficiency in illustration skills.
09. Demonstrate proficiency in applied design skills.
10. Demonstrate proficiency in airbrush skills (optional).
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial SECONDARY NUMBER 8718000
PROGRAM TITLE: Basic Commercial Art PROGRAM NUMBER: ________

01.0 DEMONSTRATE PROFICIENCY IN COMMUNICATION SKILLS--The student will be able to:

01.01 Take notes, listen, and comply with instructions.
01.02 Read instructions thoroughly.
01.03 Request clarification of instructions (ask questions).
01.04 Relay instructions to others orally and in writing.
01.05 Define and explain commercial art terms.
01.06 Document job tasks and costs and maintain records.
01.07 Make project presentations.
01.08 Interact with your employer, fellow employees, and customers.

02.0 DEMONSTRATE PROFICIENCY IN GRAPHIC PRODUCTION--The student will be able to:

02.01 Define the differences in production processes, and estimate relative costs.
02.02 Recognize limitations for printing.
02.03 Identify and select different printing surfaces.
02.04 Identify and select appropriate printing inks.
02.05 Identify and select finishing processes.

03.0 DEMONSTRATE PROFICIENCY IN TECHNICAL ART SKILLS--The student will be able to:

03.01 Explain care and respect for all tools and equipment.
03.02 Make computations for centering, spacing, and scaling drawings.
03.03 Draw on various types of drafting media.
03.04 Interpret information from drawings, prints, and sketches.
03.05 Draw freehand sketches.
03.06 Draw auxiliary views.
03.07 Draw a one- and two-point perspective.
03.08 Make corrections on a drawing.
03.09 Draw in ink on a variety of surfaces.
03.10 Generate a glossary of technical terms.

04.0 DEMONSTRATE PROFICIENCY IN DESIGN SKILLS--The student will be able to:

04.01 Explain proper use and care of tools.
04.02 Apply principles and elements of design.
04.03 Apply color theory (pigment vs. light).
04.04 Utilize tones, hues, and values.
04.05 Sketch designs using pencil and ink.
04.06 Paint freehand or within sketched designs using mixed colors, or apply colors to produce desired shades.
04.07 Apply color for impact (color psychology).
04.08 Differentiate between line halftone and duotone and four-color process.
04.09 Demonstrate balance in design.
04.10 Demonstrate designs with symmetry and assymmetry.
04.11 Develop grids for layouts of magazine pages, ads, etc..

05.0 DEMONSTRATE PROFICIENCY IN LETTERING SKILLS--The student will be able to:

05.01 Demonstrate use and care of tools, lettering pens, t-squares, and triangles.
05.02 Identify and select lettering styles.
05.03 Perform and use pen, brush, pencil, and LeRoy lettering.
05.04 Utilize guidelines, margins, and spacing for layouts.
05.05 Paint or draw precise lettering for reproduction.
05.06 Utilize various types of prepared lettering processes.
05.07 Produce a sign on posterboard.
05.08 Determine and select lettering styles for layout sketches.
05.09 Illuminate a certificate.

06.0 DEMONSTRATE AN UNDERSTANDING OF TYPOGRAPHY--The student will be able to:

06.01 Explain proper use, care, and cleaning of equipment.
06.02 Identify and select typography materials.
06.03 Define typographic terms, including leading and kerning.
06.04 Identify and select typographic methods.
06.05 Demonstrate the ability to proofread and use proofreaders' marks.
06.06 Explain picas and points and conversion to inches.
06.07 Explain spec'ing type and copy fitting.

07.0 DEMONSTRATE PROFICIENCY IN LAYOUT AND PASTE-UP--The student will be able to:

07.01 Explain proper use and care of tools.
07.02 Identify parts of a layout.
07.03 Utilize amberlith, rubylith, screens, overlays, and register marks.
07.04 Make thumbnail-sketch pencil layouts.
07.05 Prepare comprehensives from pencil layouts.
07.06 Prepare camera-ready mechanicals from comprehensives.
07.07 Prepare specific forms of instruction on mechanicals for presentations and for a printer.
07.08 Crop and scale artwork and/or photos for layouts.
07.09 Demonstrate enlarging or reducing with a grid or proportion wheel and other methods.
07.10 Make a color separation with overlays.
07.11 Demonstrate various ruling techniques.
07.12 Demonstrate the uses of different adhesives.
07.13 Specify the use of halftones or special effects.

08.0 DEMONSTRATE PROFICIENCY IN ILLUSTRATION SKILLS--The student will be able to:

08.01 Explain proper use and care of tools.
08.02 Demonstrate elementary anatomy drawing skills.
08.03 Illustrate using ink, pencil, washes, markers, tempera, watercolor, and paints.
08.04 Demonstrate renderings of different textures using the above media.
08.05 Make illustrations using various subjects.

09.0 DEMONSTRATE PROFICIENCY IN APPLIED DESIGN--The student will be able to:

09.01 Locate and identify resource materials and develop a morgue.
09.02 Design logos.
09.03 Design stationery layouts.
09.04 Design a magazine/book cover or record jacket.
09.05 Design an ad campaign that includes newspapers, magazines, and billboards.
09.06 Design a greeting card.
09.07 Design a business card.

10.0 DEMONSTRATE PROFICIENCY IN AIRBRUSH SKILLS (OPTIONAL)--The student will be able to:

10.01 Explain proper use and care of tools.
10.02 Identify airbrush parts.
10.03 Perform airbrush exercises: dots, lines, and graded shadings.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.

11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other employees.
11.07 Identify and adopt acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Basic Commercial Art
PROGRAM NUMBER: 8718000
COURSE TITLE: Basic Commercial Art 1
COURSE NUMBER: 8718010

01.0 DEMONSTRATE PROFICIENCY IN COMMUNICATION SKILLS--The student will be able to:

01.01 Take notes, listen, and comply with instructions.
01.02 Read instructions thoroughly.
01.03 Request clarification of instructions (ask questions).
01.04 Relay instructions to others orally and in writing.
01.05 Define and explain commercial art terms.
01.06 Document job tasks and costs and maintain records.
01.07 Make project presentations.
01.08 Interact with your employer, fellow employees, and customers.

02.0 DEMONSTRATE PROFICIENCY IN GRAPHIC PRODUCTION--The student will be able to:

02.01 Define the differences in production processes, and estimate relative costs.
02.02 Recognize limitations for printing.
02.03 Identify and select different printing surfaces.
02.04 Identify and select appropriate printing inks.
02.05 Identify and select finishing processes.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 2
PROGRAM TITLE: Basic Commercial Art
PROGRAM NUMBER: 8718000
COURSE TITLE: Basic Commercial Art 2
COURSE NUMBER: 8718020

03.0 DEMONSTRATE PROFICIENCY IN TECHNICAL ART SKILLS--The student will be able to:

03.01 Explain care and respect for all tools and equipment.
03.02 Make computations for centering, spacing, and scaling drawings.
03.03 Draw on various types of drafting media.
03.04 Interpret information from drawings, prints, and sketches.
03.05 Draw freehand sketches.
03.06 Draw auxiliary views.
03.07 Draw a one- and two-point perspective.
03.08 Make corrections on a drawing.
03.09 Draw in ink on a variety of surfaces.
03.10 Generate a glossary of technical terms.

04.0 DEMONSTRATE PROFICIENCY IN DESIGN SKILLS--The student will be able to:

04.01 Explain proper use and care of tools.
04.02 Apply principles and elements of design.
04.03 Apply color theory (pigment vs. light).
04.04 Utilize tones, hues, and values.
04.05 Sketch designs using pencil and ink.
04.06 Paint freehand or within sketched designs using mixed colors, or apply colors to produce desired shades.
04.07 Apply color for impact (color psychology).
04.08 Differentiate between line halftone and duotone and four-color process.
04.09 Demonstrate balance in design.
04.10 Demonstrate designs with symmetry and assymmetry.
04.11 Develop grids for layouts of magazine pages, ads, etc..

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 3

PROGRAM TITLE: Basic Commercial Art — PROGRAM NUMBER: 8718000

COURSE TITLE: Basic Commercial Art 3 — COURSE NUMBER: 8718030

05.0 DEMONSTRATE PROFICIENCY IN LETTERING SKILLS--The student will be able to:

05.01 Demonstrate use and care of tools, lettering pens, t-squares, and triangles.
05.02 Identify and select lettering styles.
05.03 Perform and use pen, brush, pencil, and LeRoy lettering.
05.04 Utilize guidelines, margins, and spacing for layouts.
05.05 Paint or draw precise lettering for reproduction.
05.06 Utilize various types of prepared lettering processes.
05.07 Produce a sign on posterboard.
05.08 Determine and select lettering styles for layout sketches.
05.09 Illuminate a certificate.

06.0 DEMONSTRATE AN UNDERSTANDING OF TYPOGRAPHY--The student will be able to:

06.01 Explain proper use, care, and cleaning of equipment.
06.02 Identify and select typography materials.
06.03 Define typographic terms, including leading and kerning.
06.04 Identify and select typographic methods.
06.05 Demonstrate the ability to proofread and use proofreaders' marks.
06.06 Explain picas and points and conversion to inches.
06.07 Explain spec'ing type and copy fitting.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 4

PROGRAM TITLE: Basic Commercial Art — PROGRAM NUMBER: 8718000

COURSE TITLE: Basic Commercial Art 4 — COURSE NUMBER: 8718040

07.0 DEMONSTRATE PROFICIENCY IN LAYOUT AND PASTE-UP--The student will be able to:

07.01 Explain proper use and care of tools.
07.02 Identify parts of a layout.
07.03 Utilize amberlith, rubylith, screens, overlays, and register marks.
07.04 Make thumbnail-sketch pencil layouts.
07.05 Prepare comprehensives from pencil layouts.
07.06 Prepare camera-ready mechanicals from comprehensives.
07.07 Prepare specific forms of instruction on mechanicals for presentations and for a printer.
07.08 Crop and scale artwork and/or photos for layouts.
07.09 Demonstrate enlarging or reducing with a grid or proportion wheel and other methods.
07.10 Make a color separation with overlays.
07.11 Demonstrate various ruling techniques.
07.12 Demonstrate the uses of different adhesives.
07.13 Specify the use of halftones or special effects.

08.0 DEMONSTRATE PROFICIENCY IN ILLUSTRATION SKILLS--The student will be able to:

08.01 Explain proper use and care of tools.
08.02 Demonstrate elementary anatomy drawing skills.
08.03 Illustrate using ink, pencil, washes, markers, tempera, watercolor, and paints.
08.04 Demonstrate renderings of different textures using the above media.
08.05 Make illustrations using various subjects.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 5
PROGRAM TITLE: Basic Commercial Art
PROGRAM NUMBER: 8718000
COURSE TITLE: Basic Commercial Art 5
COURSE NUMBER: 8718050

09.0 DEMONSTRATE PROFICIENCY IN APPLIED DESIGN--The student will be able to:

09.01 Locate and identify resource materials and develop a morgue.
09.02 Design logos.
09.03 Design stationery layouts.
09.04 Design a magazine/book cover or record jacket.
09.05 Design an ad campaign that includes newspapers, magazines, and billboards.
09.06 Design a greeting card.
09.07 Design a business card.

10.0 DEMONSTRATE PROFICIENCY IN AIRBRUSH SKILLS (OPTIONAL)--The student will be able to:

10.01 Explain proper use and care of tools.
10.02 Identify airbrush parts.
10.03 Perform airbrush exercises: dots, lines, and graded shadings.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 6
PROGRAM TITLE: Basic Commercial Art
PROGRAM NUMBER: 8718000
COURSE TITLE: Basic Commercial Art 6
COURSE NUMBER: 8718060

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other employees.
11.07 Identify and adopt acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Basic Commercial Photography

CODE NUMBER: Secondary 8772000 Postsecondary ______

Florida CIP IN48.022400

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 10-12, 21

CERTIFICATION COVERAGE: PHOTOG 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as photographers (10221801), photo engravers (50101003), still photographers (143.062-030), finish photographers (143.382-014), or photographer helpers (967.667-010).

The program familiarizes individuals with various black and white film, their processes and printing of black and white film. The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, using film, camera, chemicals, photographic paper, laboratory practices and photographic equipment.

Listed below are the courses that comprise this program when offered at the secondary level:

8772010	Basic Commercial Photography 1
8772020	Basic Commercial Photography 2
8772030	Basic Commercial Photography 3
8772040	Basic Commercial Photography 4
8772050	Basic Commercial Photography 5
8772060	Basic Commercial Photography 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the tools, materials, processes and precision equipment found in general use throughout the photography industry for the purpose of photographing, processing and presenting photography.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform laboratory skills.
02. Control exposures (35mm camera).
03. Take basic photographs (35mm camera).

04. Operate various format cameras.
05. Finish photographs.
06. Photographic lighting techniques.
07. Take studio photographs.
08. Reproduce photographic media.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8772000

PROGRAM TITLE: Basic Commercial Photography POSTSECONDARY NUMBER: ______

01.0 PERFORM LABORATORY SKILLS--The student will be able to:

01.01 Mix developers and other chemicals.
01.02 Hand-process black and white film.
01.03 Print black and white photographs.
01.04 Process black and white paper.

02.0 CONTROL EXPOSURES (35mm CAMERA)--The student will be able to:

02.01 Set appropriate f-stops and shutter speeds.
02.02 Select appropriate film type.

03.0 TAKE BASIC PHOTOGRAPHS (35mm CAMERA)--The student will be able to:

03.01 Apply camera care and maintenance principles.
03.02 Compose photographs.
03.03 Take still photographs.
03.04 Take action photographs.

04.0 OPERATE VARIOUS FORMAT CAMERAS--The student will be able to:

04.01 Use 2¼ format camera.
04.02 Use view cameras.

05.0 FINISH PHOTOGRAPHS--The student will be able to:

05.01 Mount photographs.
05.02 Mat/frame photographs.

06.0 PHOTOGRAPHIC LIGHTING TECHNIQUES--The student will be able to:

06.01 Take photographs with available light.
06.02 Take photographs with electronic strobe.
06.03 Take photographs with photo-flood lighting.

07.0 TAKE STUDIO PHOTOGRAPHS--The student will be able to:

07.01 Take commercial photographs.
07.02 Take portraits.

08.0 REPRODUCE PHOTOGRAPHIC MEDIA--The student will be able to:

08.01 Copy prints.
08.02 Copy transparencies.
08.03 Make internegatives.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.

10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Commercial Photography

PROGRAM NUMBER: 8772000

COURSE TITLE: Basic Commercial Photography 1

COURSE NUMBER: 8772010

COURSE DESCRIPTION:

This is one course in a series of six courses that comprise the program. Introductory course in 35mm camera operation. The use of various light meters in the 35mm cameras as well as hand held light meters will be reviewed. Focusing systems are considered. Film types are compared to lighting conditions for proper exposures. Film loading and unloading are considered. The reciprocal value of apertures and shutter speeds are examined.

02.0 CONTROL EXPOSURES (35mm CAMERA)--The student will be able to:

- 02.01 Set appropriate f-stops and shutter speeds.
- 02.02 Select appropriate film type.

03.0 TAKE BASIC PHOTOGRAPHS (35mm CAMERA)--The student will be able to:

- 03.01 Apply camera care and maintenance principles.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Commercial Photography

PROGRAM NUMBER: 8772000

COURSE TITLE: Basic Commercial Photography 2

COURSE NUMBER: 8772020

COURSE DESCRIPTION:

This course is one in a series of six courses. The guidelines of composing within the photographic frame are discussed. Posing one or more subjects for portraiture in the studio is considered. The guidelines for setting up a still life are introduced. Other rules for arranging groups, determining format, color harmony, and perspective are introduced.

03.0 TAKE BASIC PHOTOGRAPHS (35mm CAMERA)--The student will be able to:

- 03.02 Compose photographs.
- 03.03 Take still photographs.
- 03.04 Take action photographs.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Commercial Photography

PROGRAM NUMBER: 8772000

COURSE TITLE: Basic Commercial Photography 3

COURSE NUMBER: 8772030

COURSE DESCRIPTION:

This is one course in a series of six courses. This course is designed to expose the student to the film processing and enlarging of with the use of photographic chemicals and solutions. Operation of the photographic enlarger is included.

01.0 PERFORM LABORATORY SKILLS--The student will be able to:

- 01.01 Mix developers and other chemicals.
- 01.02 Hand-process black and white film.
- 01.03 Print black and white photographs.
- 01.04 Process black and white paper.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial COURSE CREDIT: 1
PROGRAM TITLE: Basic Commercial Photography PROGRAM NUMBER: 8772000
COURSE TITLE: Basic Commercial Photography 4 COURSE NUMBER: 8772040

COURSE DESCRIPTION:

This is one course in a series of six courses. This course is designed to expose the student in advanced instruction in the use of commercial cameras.

04.0 OPERATE VARIOUS FORMAT CAMERAS--The student will be able to:

04.01 Use 2¼ format camera.
04.02 Use view cameras.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial COURSE CREDIT: 1
PROGRAM TITLE: Basic Commercial Photography PROGRAM NUMBER: 8772000
COURSE TITLE: Basic Commercial Photography 5 COURSE NUMBER: 8772050

COURSE DESCRIPTION:

This is one course in a series of six courses. The use of studio lights are reviewed for commercial photography. Formal portraiture lighting, as well as electronic strobe are examined.

06.0 PHOTOGRAPHIC LIGHTING TECHNIQUES--The student will be able to:

06.01 Take photographs with available light.
06.02 Take photographs with electronic strobe.
06.03 Take photographs with photo-flood lighting.

07.0 TAKE STUDIO PHOTOGRAPHS--The student will be able to:

07.01 Take commercial photographs.
07.02 Take portraits.

08.0 REPRODUCE PHOTOGRAPHIC MEDIA--The student will be able to:

08.01 Copy prints.
08.02 Copy transparencies.
08.03 Make internegatives.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial COURSE CREDIT: 1
PROGRAM TITLE: Basic Commercial Photography PROGRAM NUMBER: 8772000
COURSE TITLE: Basic Commercial Photography 6 COURSE NUMBER: 8772060

COURSE DESCRIPTION:

This is one course in a series of six courses. This course covers that methods of preparing photographic prints for presentation by means of mounting , matting, framing and spraying. Photographic spotting and retouching are also considered. Employability skills are covered in this course.

05.0 FINISH PHOTOGRAPHS--The student will be able to:

05.01 Mount photographs.
05.02 Mat/frame photographs.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK — PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION — EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Basic Gasoline Engine Mechanics

CODE NUMBER: Secondary 8766000 — Postsecondary ______

Florida CIP IN47.062600

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 10-12, 21

CERTIFICATION COVERAGE: GASENG RPR 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as gas engine repairers (625.281-026), small engine mechanics (625.281-034), power saw mechanics (625.281-030), or motorcycle mechanics (620.281-054).

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, basic math skills, reading service manuals, use of microfiche and parts catalogs, hand tools, power tools, overhaul tools; servicing and reconditioning engines; troubleshooting and repairing the following systems: ignition, fuel, power transfer, cooling, exhaust, and starting systems; governors and speed controls; and lubrication systems.

Listed below are the courses that comprise this program when offered at the secondary level:

8766010	Basic Gasoline Engine Mechanics 1
8766020	Basic Gasoline Engine Mechanics 2
8766030	Basic Gasoline Engine Mechanics 3
8766040	Basic Gasoline Engine Mechanics 4
8766050	Basic Gasoline Engine Mechanics 5
8766060	Basic Gasoline Engine Mechanics 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in tools, test equipment, and materials. Processes used in the laboratory should be similar to those used in industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communications, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After sucessfully completing this program, the individual will be able to:

01. Demonstrate proficiency in performing laboratory operations to industry standards.
02. Demonstrate proficiency in applying customer service skills.
03. Demonstrate proficiency in applying basic mathematics skills.
04. Demonstrate proficiency in repairing and maintaining basic 2-stroke cycle engines.
05. Demonstrate proficiency in repairing and maintaining basic 4-stroke cycle engines.
06. Demonstrate proficiency in repairing and maintaining engine systems.
07. Demonstrate proficiency in repairing engine interior components.
08. Demonstrate proficiency in repairing power transfer systems.
09. Demonstrate proficiency in servicing, repairing, and adjusting specific types of engines (elective options).
10. Demonstrate employability skills.
11. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — SECONDARY NUMBER: 8766000

PROGRAM TITLE: Basic Gasoline Engine Mechanics — POSTSECONDARY NUMBER: ______

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING LABORATORY OPERATIONS TO INDUSTRY STANDARDS--The student will be able to:

01.01 **Apply Safety Rules & Procedures**
01.02 Practice shop safety rules and procedures
01.03 Practice personal safety rules and procedures
01.04 Practice fire safety rules and procedures
01.05 Practice electrical safety rules and procedures
01.06 Practice air tools safety rules and procedures
01.07 Maintain a clean engine repair shop
01.08 **Use Laboratory Tools & Equipment**
01.09 Use general hand tools
01.10 Use special hand tools
01.11 Use precision measuring tools
01.12 Use power tools
01.13 Use fasteners
01.14 Use gaskets and choose sealants

02.0 DEMONSTRATE PROFICIENCY IN APPLYING CUSTOMER SERVICE SKILLS --The student will be able to:

02.01 Prepare service orders properly
02.02 Communicate solutions to customers
02.03 Locate engine models and types
02.04 Follow manufacturers' service manuals
02.05 Locate parts in a parts catalog or on microfiche
02.06 Complete service or work orders including any warranty information required by the manufacturer

03.0 DEMONSTRATE PROFICIENCY IN APPLYING BASIC MATHEMATICS SKILLS --The student will be able to:

03.01 Read and interpret measuring devices (rules and tapes)
03.02 Add 100 addition combinations
03.03 Add two-digit numbers
03.04 Add three-digit numbers
03.05 Subtract 100 subtraction combinations
03.06 Subtract two-, three-, and four-digit numbers
03.07 Solve one-digit divisor problems
03.08 Solve two-digit divisor problems
03.09 Solve two- and three-digit divisor problems
03.10 Solve multiplication facts
03.11 Multiply by a one-digit factor
03.12 Multiply by a two-digit factor
03.13 Identify the parts of a fraction
03.14 Identify fractional parts
03.15 Solve fractional word problems
03.16 Classify types of fractions
03.17 Illustrate equivalent fractions
03.18 Convert fractions
03.19 Reduce fractions
03.20 Solve decimal notations
03.21 Solve number word problems
03.22 Round to the nearest whole number
03.23 Add decimals
03.24 Subtract decimals
03.25 Multiply decimals
03.26 Divide a decimal by a decimal
03.27 Divide a whole number by a decimal
03.28 Write fractions as decimals and percents
03.29 Write percents as fractions and decimals
03.30 Solve percent problems
03.31 Find the percent of a number
03.32 Operate simple hand-held calculators
03.33 Understand and use the metric system
03.34 Convert inches to millimeters and millimeters to inches

04.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC 2-STROKE CYCLE ENGINES--The student will be able to:

04.01 Explain the basic principles of the operation of the 2-stroke cycle internal combustion engine
04.02 Identify types of engines
04.03 Locate engine serial and model numbers
04.04 Identify engine assemblies and systems
04.05 Disassemble engines
04.06 Remove, clean, and inspect the head for cracks, warpage, and damaged spark plug threads
04.07 Remove, clean, and inspect piston rods and assemblies
04.08 Measure out-of-round piston and cylinder
04.09 Hone cylinders
04.10 Check the total bearing surface of connecting rod bearings
04.11 Measure piston skirts and ring grooves
04.12 Measure the piston-ring gap in the cylinder bore
04.13 Install piston pins according to manufacturer's specifications
04.14 Check rod and piston assembly alignment
04.15 Install rings on pistons
04.16 Install piston rod assemblies
04.17 Check needle bearings
04.18 Inspect crankshafts and install seals
04.19 Inspect, clean, and/or replace reed valves
04.20 Reassemble engines

05.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC 4-STROKE CYCLE ENGINES--The student will be able to:

05.01 Explain the basic principles of the operation of the 4-stroke cycle internal combustion engine
05.02 Identify types of 4-stroke cycle engines
05.03 Locate engine serial and model numbers
05.04 Identify engine assemblies and systems
05.05 Disassemble engines
05.06 Clean and inspect heads for cracks, warpage, and damaged spark plug threads
05.07 Inspect valves for warpage, burns, cracks, stem wear, tip wear, and margin
05.08 Grind valve seats and reface valves
05.09 Check and inspect springs for free height, distortion, and installed height
05.10 Adjust valve lash
05.11 Remove and inspect camshafts and lifters (ONAN engines)
05.12 Measure camshafts (ONAN and KOHLER engines)
05.13 Service camshaft bearings (ONAN engines)
05.14 Clean and inspect lifters for wear (ONAN engines)
05.15 Time valve drive assemblies
05.16 Remove piston from rods assemblies
05.17 Measure out-of-round and cylinder taper with a dial bore gauge or micrometer
05.18 Check piston pins and bosses for wear
05.19 Measure piston ring lands width, out-of-round, and taper
05.20 Measure the piston-ring gap in the cylinder bore
05.21 Install and fit piston pins
05.22 Check rod and piston assembly alignment
05.23 Remove and replace rod bearings
05.24 Hone and clean cylinders
05.25 Install rings on pistons
05.26 Measure and check crankshafts with a micrometer
05.27 Check for end play
05.28 Check the bearing bore with a telescoping gauge using special tools provided by the engine manufacturer
05.29 Reassemble engines
05.30 Install oil seals

06.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING ENGINE SYSTEMS --The student will be able to:

06.01 **Diagnose and Repair Ignition Systems**
06.02 Identify ignition systems and components
06.03 Repair magneto ignition systems
06.04 Repair solid-state ignition systems

06.05 Repair battery ignition systems
06.06 Repair impulse ignition systems
06.07 Identify spark plugs and special applications
06.08 Remove, adjust, and replace spark plugs
06.09 Adjust ignition system timing
06.10 **Service Fuel Systems**
06.11 Service air filters
06.12 Service or replace fuel filters
06.13 Service and repair suction-type carburetors
06.14 Service and repair diaphragm-type carburetors
06.15 Service and repair float-type carburetors
06.16 Remove and service fuel supply systems
06.17 Determine and use correct fuel and fuel mixtures
06.18 **Service, Repair, and Adjust Engine Controls**
06.19 Service, repair, and adjust governor speed controls
06.20 Service, repair, and adjust remote speed controls
06.21 Service, repair, and adjust manual start-stop controls
06.22 Service, repair, and adjust electrical start-stop controls
06.23 Service, repair, and adjust zone systems
06.24 Service, repair, and adjust blade-clutch controls
06.25 Service, repair, and adjust chain brake systems
06.26 **Repair and Service Lubrication Systems**
06.27 Select proper oil grades/types
06.28 Repair and service lubrication systems
06.29 Service crankcase breathers
06.30 Replace seals and gaskets
06.31 Identify oil grade terms
06.32 Identify lubrication systems
06.33 Identify, understand, and relate types and ratios of 2-cycle mix oils and their relationship to specific pieces of equipment
06.34 **Service Cooling and Exhaust Systems**
06.35 Service air cooling fins and screens
06.36 Service 2-cycle exhaust systems
06.37 Service 4-cycle exhaust systems
06.38 **Diagnose, Service, Repair, and Adjust Electrical Systems**
06.39 Operate electrical testing instruments
06.40 Replace electrical-system components
06.41 Test and service batteries according to manufacturers' requirements and the use of the battery (i.e., motorcycle batteries require a trickle charge at 1.5 amps over a period of 8 hours)
06.42 **Service and Repair Starting Systems**
06.43 Service and repair manual starting systems
06.44 Service and repair electrical starting systems
06.45 Test and service battery starting systems

07.0 DEMONSTRATE PROFICIENCY IN REPAIRING ENGINE INTERIOR COMPONENTS
--The student will be able to:

07.01 Service, repair, and adjust valve systems
07.02 Service, repair, and adjust rings, bores, and pistons
07.03 Service, repair, and adjust crankshafts and bearings
07.04 Service, repair, and adjust rods
07.05 Service, repair, and adjust lubrication systems
07.06 Service, repair, and adjust internal governor
07.07 Service, repair, and adjust internal components timing
07.08 Assemble complete engines to manufacturer's specifications

08.0 DEMONSTRATE PROFICIENCY IN REPAIRING POWER TRANSFER SYSTEMS
--The student will be able to:

08.01 Inspect and measure belts and chains
08.02 Install belts and chains
08.03 Repair manual transmissions
08.04 Repair differentials
08.05 Identify power transfer system components
08.06 Replace drive components
08.07 Remove and repair clutches
08.08 Sharpen and balance blades
08.09 Remove and replace or install blades correctly
08.10 Remove and replace hydraulic pump systems

09.0 DEMONSTRATE PROFICIENCY IN SERVICING, REPAIRING, AND ADJUSTING SPECIFIC TYPES OF ENGINES (ELECTIVE OPTIONS)--The student will be able to:

09.01 Service, repair, and adjust lawn and garden equipment

10.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

10.01 Conduct a job search
10.02 Secure information about a job
10.03 Identify documents that may be required when applying for a job
10.04 Complete a job application form correctly
10.05 Demonstrate competence in job interview techniques
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
10.07 Identify acceptable work habits
10.08 Demonstrate knowledge of how to make job changes appropriately
10.09 Demonstrate acceptable employee health habits
10.10 Exhibit a positive work attitude
10.11 Practice good personal hygiene
10.12 Apply human relations skills
10.13 Apply communication and leadership skills

11.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

11.01 Define entrepreneurship
11.02 Describe the importance of entrepreneurship to the American economy
11.03 List the advantages and disadvantages of business ownership
11.04 Identify the risks involved in ownership of a business
11.05 Identify the necessary personal characteristics of a successful entrepreneur
11.06 Identify the business skills needed to operate a small business efficiently and effectively

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Basic Gasoline Engine Mechanics
PROGRAM NUMBER: 8766000
COURSE TITLE: Basic Gasoline Engine Mechanics 1
COURSE NUMBER: 8766010

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing laboratory skills to industry standards and applying customer service and basic mathematics skills.

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING LABORATORY OPERATIONS TO INDUSTRY STANDARDS--The student will be able to:

01.01 **Apply Safety Rules & Procedures**
01.02 Practice shop safety rules and procedures
01.03 Practice personal safety rules and procedures
01.04 Practice fire safety rules and procedures
01.05 Practice electrical safety rules and procedures
01.06 Practice air tools safety rules and procedures
01.07 Maintain a clean engine repair shop
01.08 **Use Laboratory Tools & Equipment**
01.09 Use general hand tools
01.10 Use special hand tools
01.11 Use precision measuring tools
01.12 Use power tools
01.13 Use fasteners
01.14 Use gaskets and choose sealants

02.0 DEMONSTRATE PROFICIENCY IN APPLYING CUSTOMER SERVICE SKILLS --The student will be able to:

02.01 Prepare service orders properly
02.02 Communicate solutions to customers
02.03 Locate engine models and types
02.04 Follow manufacturers' service manuals
02.05 Locate parts in a parts catalog or on microfiche
02.06 Complete service or work orders including any warranty information required by the manufacturer

03.0 DEMONSTRATE PROFICIENCY IN APPLYING BASIC MATHEMATICS SKILLS --The student will be able to:

03.01 Read and interpret measuring devices (rules and tapes)
03.02 Add 100 addition combinations
03.03 Add two-digit numbers
03.04 Add three-digit numbers
03.05 Subtract 100 subtraction combinations
03.06 Subtract two-, three-, and four-digit numbers
03.07 Solve one-digit divisor problems
03.08 Solve two-digit divisor problems
03.09 Solve two- and three-digit divisor problems
03.10 Solve multiplication facts
03.11 Multiply by a one-digit factor
03.12 Multiply by a two-digit factor
03.13 Identify the parts of a fraction
03.14 Identify fractional parts
03.15 Solve fractional word problems
03.16 Classify types of fractions
03.17 Illustrate equivalent fractions
03.18 Convert fractions
03.19 Reduce fractions
03.20 Solve decimal notations
03.21 Solve number word problems
03.22 Round to the nearest whole number
03.23 Add decimals
03.24 Subtract decimals
03.25 Multiply decimals
03.26 Divide a decimal by a decimal
03.27 Divide a whole number by a decimal
03.28 Write fractions as decimals and percents

03.29 Write percents as fractions and decimals
03.30 Solve percent problems
03.31 Find the percent of a number
03.32 Operate simple hand-held calculators
03.33 Understand and use the metric system
03.34 Convert inches to millimeters and millimeters to inches

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STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Basic Gasoline Engine Mechanics — PROGRAM NUMBER: 8766000

COURSE TITLE: Basic Gasoline Engine Mechanics 2 — COURSE NUMBER: 8766020

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for repairing and maintaining basic 2-stroke cycle engines.

04.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC 2-STROKE CYCLE ENGINES--The student will be able to:

04.01 Explain the basic principles of the operation of the 2-stroke cycle internal combustion engine
04.02 Identify types of engines
04.03 Locate engine serial and model numbers
04.04 Identify engine assemblies and systems
04.05 Disassemble engines
04.06 Remove, clean, and inspect the head for cracks, warpage, and damaged spark plug threads
04.07 Remove, clean, and inspect piston rods and assemblies
04.08 Measure out-of-round piston and cylinder
04.09 Hone cylinders
04.10 Check the total bearing surface of connecting rod bearings
04.11 Measure piston skirts and ring grooves
04.12 Measure the piston-ring gap in the cylinder bore
04.13 Install piston pins according to manufacturer's specifications
04.14 Check rod and piston assembly alignment
04.15 Install rings on pistons
04.16 Install piston rod assemblies
04.17 Check needle bearings
04.18 Inspect crankshafts and install seals
04.19 Inspect, clean, and/or replace reed valves
04.20 Reassemble engines

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Basic Gasoline Engine Mechanics — PROGRAM NUMBER: 8766000

COURSE TITLE: Basic Gasoline Engine Mechanics 3 — COURSE NUMBER: 8766030

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for repairing and maintaining basic 4-stroke cycle engines.

05.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC 4-STROKE CYCLE ENGINES--The student will be able to:

05.01 Explain the basic principles of the operation of the 4-stroke cycle internal combustion engine

05.02 Identify types of 4-stroke cycle engines
05.03 Locate engine serial and model numbers
05.04 Identify engine assemblies and systems
05.05 Disassemble engines
05.06 Clean and inspect heads for cracks, warpage, and damaged spark plug threads
05.07 Inspect valves for warpage, burns, cracks, stem wear, tip wear, and margin
05.08 Grind valve seats and reface valves
05.09 Check and inspect springs for free height, distortion, and installed height
05.10 Adjust valve lash
05.11 Remove and inspect camshafts and lifters (ONAN engines)
05.12 Measure camshafts (ONAN and KOHLER engines)
05.13 Service camshaft bearings (ONAN engines)
05.14 Clean and inspect lifters for wear (ONAN engines)
05.15 Time valve drive assemblies
05.16 Remove piston from rods assemblies
05.17 Measure out-of-round and cylinder taper with a dial bore gauge or micrometer
05.18 Check piston pins and bosses for wear
05.19 Measure piston ring lands width, out-of-round, and taper
05.20 Measure the piston-ring gap in the cylinder bore
05.21 Install and fit piston pins
05.22 Check rod and piston assembly alignment
05.23 Remove and replace rod bearings
05.24 Hone and clean cylinders
05.25 Install rings on pistons
05.26 Measure and check crankshafts with a micrometer
05.27 Check for end play
05.28 Check the bearing bore with a telescoping gauge using special tools provided by the engine manufacturer
05.29 Reassemble engines
05.30 Install oil seals

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Gasoline Engine Mechanics PROGRAM NUMBER: 8766000

COURSE TITLE: Basic Gasoline Engine Mechanics 4 COURSE NUMBER: 8766040

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for repairing and maintaining engine systems and repairing engine interior components.

06.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING ENGINE SYSTEMS --The student will be able to:

06.01 **Diagnose and Repair Ignition Systems**
06.02 Identify ignition systems and components
06.03 Repair magneto ignition systems
06.04 Repair solid-state ignition systems
06.05 Repair battery ignition systems
06.06 Repair impulse ignition systems
06.07 Identify spark plugs and special applications
06.08 Remove, adjust, and replace spark plugs
06.09 Adjust ignition system timing
06.10 **Service Fuel Systems**
06.11 Service air filters
06.12 Service or replace fuel filters
06.13 Service and repair suction-type carburetors
06.14 Service and repair diaphragm-type carburetors
06.15 Service and repair float-type carburetors
06.16 Remove and service fuel supply systems
06.17 Determine and use correct fuel and fuel mixtures

06.18 **Service, Repair, and Adjust Engine Controls**
06.19 Service, repair, and adjust governor speed controls
06.20 Service, repair, and adjust remote speed controls
06.21 Service, repair, and adjust manual start-stop controls
06.22 Service, repair, and adjust electrical start-stop controls
06.23 Service, repair, and adjust zone systems
06.24 Service, repair, and adjust blade-clutch controls
06.25 Service, repair, and adjust chain brake systems
06.26 **Repair and Service Lubrication Systems**
06.27 Select proper oil grades/types
06.28 Repair and service lubrication systems
06.29 Service crankcase breathers
06.30 Replace seals and gaskets
06.31 Identify oil grade terms
06.32 Identify lubrication systems
06.33 Identify, understand, and relate types and ratios of 2-cycle mix oils and their relationship to specific pieces of equipment
06.34 **Service Cooling and Exhaust Systems**
06.35 Service air cooling fins and screens
06.36 Service 2-cycle exhaust systems
06.37 Service 4-cycle exhaust systems
06.38 **Diagnose, Service, Repair, and Adjust Electrical Systems**
06.39 Operate electrical testing instruments
06.40 Replace electrical-system components
06.41 Test and service batteries according to manufacturers' requirements and the use of the battery (i.e., motorcycle batteries require a trickle charge at 1.5 amps over a period of 8 hours)
06.42 **Service and Repair Starting Systems**
06.43 Service and repair manual starting systems
06.44 Service and repair electrical starting systems
06.45 Test and service battery starting systems

07.0 DEMONSTRATE PROFICIENCY IN REPAIRING ENGINE INTERIOR COMPONENTS
--The student will be able to:

07.01 Service, repair, and adjust valve systems
07.02 Service, repair, and adjust rings, bores, and pistons
07.03 Service, repair, and adjust crankshafts and bearings
07.04 Service, repair, and adjust rods
07.05 Service, repair, and adjust lubrication systems
07.06 Service, repair, and adjust internal governor
07.07 Service, repair, and adjust internal components timing
07.08 Assemble complete engines to manufacturer's specifications

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STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Basic Gasoline Engine Mechanics
PROGRAM NUMBER: 8766000

COURSE TITLE: Basic Gasoline Engine Mechanics 5
COURSE NUMBER: 8766050

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for repairing power transfer systems.

08.0 DEMONSTRATE PROFICIENCY IN REPAIRING POWER TRANSFER SYSTEMS
--The student will be able to:

08.01 Inspect and measure belts and chains
08.02 Install belts and chains
08.03 Repair manual transmissions
08.04 Repair differentials
08.05 Identify power transfer system components
08.06 Replace drive components
08.07 Remove and repair clutches
08.08 Sharpen and balance blades

08.09 Remove and replace or install blades correctly
08.10 Remove and replace hydraulic pump systems

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Basic Gasoline Engine Mechanics
PROGRAM NUMBER: 8766000

COURSE TITLE: Basic Gasoline Engine Mechanics 6
COURSE NUMBER: 8766060

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for service, repair, and adjustment of specific types of engines (elective options) and demonstration of employability skills.

09.0 DEMONSTRATE PROFICIENCY IN SERVICING, REPAIRING, AND ADJUSTING SPECIFIC TYPES OF ENGINES (ELECTIVE OPTIONS)--The student will be able to:

09.01 Service, repair, and adjust lawn and garden equipment

10.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

10.01 Conduct a job search
10.02 Secure information about a job
10.03 Identify documents that may be required when applying for a job
10.04 Complete a job application form correctly
10.05 Demonstrate competence in job interview techniques
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
10.07 Identify acceptable work habits
10.08 Demonstrate knowledge of how to make job changes appropriately
10.09 Demonstrate acceptable employee health habits
10.10 Exhibit a positive work attitude
10.11 Practice good personal hygiene
10.12 Apply human relations skills
10.13 Apply communication and leadership skills

11.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

11.01 Define entrepreneurship
11.02 Describe the importance of entrepreneurship to the American economy
11.03 List the advantages and disadvantages of business ownership
11.04 Identify the risks involved in ownership of a business
11.05 Identify the necessary personal characteristics of a successful entrepreneur
11.06 Identify the business skills needed to operate a small business efficiently and effectively

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Basic Marine Mechanics

CODE NUMBER: Secondary 8751000 Postsecondary ______

Florida CIP IN49.032600

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVEL(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 10-12, 21

CERTIFICATION COVERAGE: DESEL MECH 7 MTRBT MECH @ 7 GASENG RPR 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as marine engine mechanics (623.281-026) and outboard motor mechanics (623.281-042), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices; service and repair of electrical, mechanical, power transfer, hydraulic, fuel and cooling systems; boat rigging and trailers; and preparation of sales merchandise.

Listed below are the courses that comprise this program when offered at the secondary level:

8751010	Basic Marine Mechanics 1
8751020	Basic Marine Mechanics 2
8751030	Basic Marine Mechanics 3
8751040	Basic Marine Mechanics 4
8751050	Basic Marine Mechanics 5
8751060	Basic Marine Mechanics 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in tools, test equipment, current model outboard motors, inboard-outdrive motors, location and installation of accessories, boat trailers, and operational testing.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communications, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the cooperative occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After sucessfully completing this program, the individual will be able to:

01. Perform shop practices to industry standards.
02. Maintain and repair basic 4-stroke cycle engines.
03. Maintain and repair basic 2-stroke cycle engines.
04. Maintain and repair electrical systems.
05. Maintain and repair cranking systems.
06. Maintain and repair ignition systems.
07. Maintain and repair outboard charging systems.
08. Maintain and repair fuel systems.
09. Maintain and repair cooling systems.
10. Maintain and repair lubrication systems.
11. Maintain and repair outdrives, transmissions, and intermediate housings.
12. Assemble and maintain outboard lower units and housing assemblies.
13. Use marine woods, metals, and fiber glass.
14. Adjust and repair trailers.
15. Prepare and deliver sales merchandise.
16. Demonstrate employability skills.
17. Demonstrate and understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education
SECONDARY NUMBER: 8751000
PROGRAM TITLE: Basic Marine Mechanics
POSTSECONDARY NUMBER: ____

01.0 PERFORM SHOP PRACTICES TO INDUSTRY STANDARDS--The student will be able to:

01.01 Comply with safety rules and regulations
01.02 Use hand tools safely and properly
01.03 Set up and use power tools safely and properly
01.04 Set up and use precision measuring tools
01.05 Drill and remove broken studs and install helicoils
01.06 Identify threaded fasteners by size, type, thread series, thread classes, material hardness, and compatibility
01.07 Identify and make gaskets and seals
01.08 Read and use parts manuals
01.09 Read, interpret, and apply service manuals
01.10 Locate and match electrical units by their symbols on a wiring diagram

02.0 MAINTAIN AND REPAIR BASIC 4-STROKE CYCLE ENGINES--The student will be able to:

02.01 Explain the basic principles of the operation of 4-stroke cycle internal combustion engines
02.02 Identify types of 4-stroke cycle engines
02.03 Locate engine serial and model numbers
02.04 Identify engine assemblies and systems
02.05 Diagnose valve and head problems by use of the visual inspection method
02.06 Diagnose valve and head problems by use of the compression tester method
02.07 Diagnose valve and head problems by use of the cylinder air pressure method
02.08 Disassemble engines and inspect parts
02.09 Clean and inspect heads for cracks, warpage, and damaged spark plug threads
02.10 Inspect valves for warpage, burns, cracks, stem wear, tip wear, and margin
02.11 Grind valve seats and reface valves
02.12 Check and inspect springs for free height, distortion, and installed height
02.13 Adjust valve lash
02.14 Move and inspect camshafts and lifters
02.15 Measure camshafts
02.16 Clean and inspect lifters for wear
02.17 Time valve drive assemblies
02.18 Remove pistons from rod assemblies
02.19 Measure out-of-round and cylinder taper with a dial bore gauge or micrometer
02.20 Check piston pins and bosses for wear
02.21 Measure piston ring lands width, out-of-round, and taper
02.22 Measure the piston ring gap in cylinder bores
02.23 Install and fit piston pins
02.24 Check rod and piston assembly alignment
02.25 Remove and replace rod bearings
02.26 Hone and clean cylinders
02.27 Install rings on pistons
02.28 Measure and check crankshafts with a micrometer
02.29 Check for end play
02.30 Check bearing bores with a telescoping gauge
02.31 Reassemble engines
02.32 Install oil seals

03.0 MAINTAIN AND REPAIR BASIC 2-STROKE CYCLE ENGINES--The student will be able to:

03.01 Explain the basic principles of the operation of 2-stroke cycle internal combustion engines
03.02 Identify types of engines
03.03 Locate engine serial and model numbers
03.04 Identify engine assemblies and systems

03.05 Disassemble engines
03.06 Remove, clean, and inspect heads for cracks, warpage, and damaged spark plug threads
03.07 Diagnose head problems by use of the visual inspection method
03.08 Diagnose head problems by use of the compression tester method
03.09 Diagnose head problems by use of the cylinder air pressure method
03.10 Diagnose head problems by use of the stethoscope method
03.11 Remove, clean, and inspect piston rods and assemblies
03.12 Measure out-of-round of pistons and cylinders
03.13 Hone cylinders
03.14 Check the total bearing surface of connecting rod bearings
03.15 Measure piston skirts and ring grooves
03.16 Measure the piston ring gap in cylinder bores
03.17 Install piston pins according to manufacturer's specifications
03.18 Check rod and piston assembly alignment
03.19 Install rings on pistons
03.20 Install piston rod assemblies
03.21 Measure and check crankshafts with a micrometer
03.22 Check needle bearings
03.23 Inspect crankshafts and install seals
03.24 Inspect, clean, and/or replace reed valves
03.25 Reassemble engines

04.0 MAINTAIN AND REPAIR ELECTRICAL SYSTEMS--The student will be able to:

04.01 Set up and use voltmeters, ammeters, and ohmmeters
04.02 Locate and identify electrical circuit components
04.03 Sketch a typical circuit using a single wire system
04.04 Test storage batteries using a hydrometer
04.05 Test storage batteries using a light and load test
04.06 Charge storage batteries
04.07 Remove and replace batteries and service battery boxes
04.08 Repair damaged wire and electrical harnesses
04.09 Diagnose circuit troubles using continuity or a test light and low reading voltmeters to record voltage drop
04.10 Sketch and label typical fuel gauge systems
04.11 Remove and replace ampmeters or indicating lights
04.12 Remove and replace fuel gauges
04.13 Remove and replace fuel sending units
04.14 Diagnose gauges and accessory system troubles using test lights, voltmeters, ampmeters, or detached sending units
04.15 Sketch typical circuits such as those for auto bilge pumps or navigation lights
04.16 Locate opens, shorts, and grounds

05.0 MAINTAIN AND REPAIR CRANKING SYSTEMS--The student will be able to:

05.01 Disassemble recoil starters
05.02 Inspect components of recoil starters
05.03 Reassemble recoil starters
05.04 Identify components of electrical starting systems
05.05 Disassemble different types of starting motors
05.06 Bench test armatures
05.07 Bench test field coils
05.08 Bench test drive units
05.09 Bench test switches
05.10 Bench test minor parts of starting motor components
05.11 Use armature lathes for turning commutators
05.12 Install, reassemble, and test new starter parts
05.13 Troubleshoot starting systems using battery-starter testers
05.14 Troubleshoot starting systems using voltmeters for finding excessive voltage drop
05.15 Recondition solenoids, drives, and other components
05.16 Set up and use battery-starter (load) testers
05.17 Locate opens, shorts, and grounds

06.0 MAINTAIN AND REPAIR IGNITION SYSTEMS--The student will be able to:

06.01 **Maintain and Repair Magneto Ignition Systems**
06.02 Sketch and label electrical symbols
06.03 Set up and use ohmmeters
06.04 Set up and use voltmeters
06.05 Set up and use ignition testers

06.06 Set up and use ignition analyzers
06.07 Locate and identify parts of magneto ignitions
06.08 Locate and match electrical units by their symbols on a wiring diagram
06.09 Sketch and label complete magneto ignition systems
06.10 Check coil resistance with an ohmmeter
06.11 Check points for continuity and resistance
06.12 Check condensers for capacity, leaks, and shorts
06.13 Clean and regap spark plugs
06.14 **Maintain and Repair Battery Ignition Systems**
06.15 Locate and identify parts of battery ignitions
06.16 Locate and match electrical units by their symbols on a wiring diagram
06.17 Sketch and label complete battery ignition systems
06.18 Check coil resistance with an ohmmeter
06.19 Check points for continuity and resistance
06.20 Check condensers for capacity, leaks, and shorts
06.21 Set up and use test equipment
06.22 Set timing using a timing light
06.23 **Maintain and Repair Capacitor Discharge Ignition Systems**
06.24 Sketch and label electrical symbols
06.25 Set up and use ohmmeters
06.26 Set up and use a CD-77
06.27 Set up and use spark testers
06.28 Set up and use neon test lights
06.29 Set up and use low/high ampmeters
06.30 Set up and use voltmeters
06.31 Locate and identify parts of capacitor discharge ignition systems
06.32 Locate and match electrical units by their symbols on a wiring diagram
06.33 Sketch and label complete C/D ignition systems
06.34 Check coil resistance, shorts, and grounds with an ohmmeter
06.35 Check stator windings with an ohmmeter
06.36 Check sensor coils, charge coils, ignition coils, and shorts to ground with a CD-77
06.37 Check power packs with an ohmmeter and a CD-77

07.0 MAINTAIN AND REPAIR OUTBOARD CHARGING SYSTEMS--The student will be able to:

07.01 Sketch and label the units of complete charging circuits
07.02 Disassemble charging systems and identify the components
07.03 Perform stator and rectifier testing on charging systems
07.04 Reassemble and test charging systems
07.05 Set up and use ohmmeters
07.06 Test regulators
07.07 Reassemble and test complete units

08.0 MAINTAIN AND REPAIR FUEL SYSTEMS--The student will be able to:

08.01 **Maintain and Repair Fuel Systems**
08.02 Identify and locate fuel system components (fuel tanks, lines, filters, etc.)
08.03 Sketch and label the parts of total fuel systems
08.04 Service fuel lines
08.05 Remove, clean, and install fuel tanks
08.06 Identify and locate fuel pump vacuums
08.07 Remove, replace, service, and check the pressure of fuel pumps
08.08 Remove, clean, and replace in-line filters
08.09 Identify the major types of carburetors
08.10 Check and adjust throttle and governor linkages
08.11 **Maintain and Repair Two-stroke Cycle Carburetors**
08.12 Sketch and label the parts of total fuel systems
08.13 Service fuel lines and primer bulbs (vacuum test)
08.14 Remove, clean, inspect, and install fuel tanks
08.15 Identify basic carburetor circuits (chokes; floats; fuel inlets; idle, intermediate, and high speeds; mains, etc.)
08.16 Identify and locate fuel pumps
08.17 Remove, inspect, and replace fuel pumps
08.18 Remove, clean, overhaul, replace, and make final adjustments to carburetors
08.19 Remove, service, and replace air cleaners
08.20 Diagnose carburetor problems

08.21 Remove, inspect, and replace reed valves and gaskets
08.22 Diagnose exhaust problems such as back pressure and scavenging
08.23 Inspect and service oil metering systems
08.24 Determine and make appropriate fuel-oil mixtures
08.25 **Maintain and Repair Inboard Gas Systems**
08.26 Remove, service, and replace carburetor air cleaners/flame arrestors
08.27 Identify and locate fuel system components (fuel pumps, carburetors and air filters, linkages, and intake manifolds)
08.28 Remove, clean, overhaul, replace, and make final adjustments to carburetors

09.0 MAINTAIN AND REPAIR COOLING SYSTEMS--The student will be able to:

09.01 Explain the principles of cooling systems, including fresh water cooling systems
09.02 Trace water flow through cooling systems
09.03 Disassemble and reassemble water pumps
09.04 Remove, check, and replace thermostats
09.05 Use thermostat pressure relief systems
09.06 Service manifolds, risers, and thermostat housings
09.07 Service water cooling systems for gas inboard, gas outboard, and diesel engines

10.0 MAINTAIN AND REPAIR LUBRICATION SYSTEMS--The student will be able to:

10.01 Identify the types and functions of lubrication systems
10.02 Explain the principles of lubrication systems
10.03 Identify and locate components of lubrication systems
10.04 Check engines for oil leaks
10.05 Change engine oil and filters
10.06 Check engine oil pressure and level
10.07 Recognize and use only recommended oil

11.0 MAINTAIN AND REPAIR OUTDRIVES, TRANSMISSIONS, AND INTERMEDIATE HOUSINGS --The student will be able to:

11.01 **Maintain and Repair Intermediate Housings**
11.02 Disassemble main drive shafts
11.03 Shim drive shafts to intermediate housings
11.04 Remove and replace clutch assemblies
11.05 Check electrical components with proper test equipment
11.06 Remove and replace "U" joints
11.07 Disassemble outer transom plates
11.08 Adjust trim and limit switches
11.09 Disassemble cylinder rams
11.10 **Maintain and Repair Stern Drive Upper Gear Case**
11.11 Determine the differences between mechanical, electrical, and hydraulic shifting units
11.12 Disassemble and reassemble each type of shifting unit
11.13 Reshim units to manufacturer's specifications
11.14 Use the proper oil to refill upper and lower gear cases
11.15 **Perform Upper to Lower Gear Case Maintenance**
11.16 Disassemble exhaust housings
11.17 Inspect seals, "O" rings, shafts, and bearings
11.18 Reassemble exhaust housings
11.19 **Maintain and Repair Lower Gear Cases**
11.20 Determine the differences between mechanical, electrical, and hydraulic shifting
11.21 Remove and replace lower gear cases
11.22 Reshim lower gear cases
11.23 Refill lower gear cases with specified oil
11.24 Determine propeller pitch, diameter, and hub type
11.25 **Maintain and Repair Transmissions**
11.26 Inspect planetary clutch plate air coupling assemblies
11.27 Remove and replace transmissions
11.28 Use proper service tools in shimming, reassembly, and testing
11.29 **Lubricate Transmissions**
11.30 Drain transmissions
11.31 Determine capacity using the transmission service manuals
11.32 Refill transmissions according to manufacturer's specifications

12.0 ASSEMBLE AND MAINTAIN OUTBOARD LOWER UNITS AND HOUSING ASSEMBLIES --The student will be able to:

12.01 Disassemble and reassemble steering handle groups
12.02 Disassemble and assemble exhaust housings and water tube assemblies
12.03 Replace motor mounts and shock absorbers
12.04 Lubricate all fittings
12.05 Pressure and vacuum test gear cases
12.06 Remove and test cylinders and rams
12.07 Adjust reverse locks
12.08 Adjust the trim and tilt
12.09 Determine the differences between mechanical, electrical, and hydraulic shifting units
12.10 Explain the shifting theory of the lower unit
12.11 Disassemble and reassemble mechanical shifting units
12.12 Disassemble and reassemble electrical shifting units
12.13 Disassemble and reassemble hydraulic shifting units
12.14 Inspect all parts for wear

13.0 USE MARINE WOODS, METALS, AND FIBER GLASS--The student will be able to:

13.001 Explain the hazards of a marine environment to woods, metals, and fiber glass
13.002 Explain a galvanic series
13.003 Explain the theory for using given materials in boat repair activities

14.0 ADJUST AND REPAIR TRAILERS--The student will be able to:

14.001 Make boat-to-trailer adjustments
14.002 Remove and replace lighting systems
14.003 Remove and replace wheel bearings and springs
14.004 Remove and replace brakes
14.005 Dissassemble, diagnose, and reassemble trim and tilt systems
14.006 Remove and test cylinder rams
14.007 Adjust reverse locks
14.008 Adust the trim and tilt

15.0 PREPARE AND DELIVER SALES MERCHANDISE--The student will be able to:

15.01 **Install Outboard Motors**
15.02 Make center line measurements
15.03 Center the plate height
15.04 Locate manufacturers' I.D. plates
15.05 **Install Control Boxes**
15.06 Mount control boxes at the helm
15.07 Place wiring and cables in a neat and orderly manner
15.08 **Make Appropriate Adjustments**
15.09 Adjust the control cables from the engine to the control box
15.10 Center the steering cable to the engine
15.11 **Install Accessories**
15.12 Find suitable locations for accessories and mount them to the boat
15.13 Lubricate shafts, install propellers, and fasten both securely
15.14 **Follow and Complete a Servicing Check List**
15.15 Check for proper levels
15.16 Check manufacturers' specifications
15.17 Test-run boats
15.18 Recheck work completed
15.19 **Install Stern Drive Units**
15.20 Check manufacturers' installation procedures
15.21 Lubricate shafts and install propellers securely
15.22 Obtain maximum oil level capacity
15.23 **Prepare Engines**
15.24 Install or connect drain plugs, pet cocks, hose clamps, hoses, etc.
15.25 Find a suitable mount location and mount the engine securely in the boat
15.26 Set engines to manufacturer's specifications
15.27 Set, adjust, and test engines to manufacturer's specifications
15.28 **Install Lighting Systems and Accessories**
15.29 Remove and replace running lights

15.30 Troubleshoot lighting systems and accessories
15.31 Check and adjust throttles, cables, horns, lights, and tachometers

16.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

16.01 Conduct a job search.
16.02 Secure information about a job.
16.03 Identify documents that may be required when applying for a job.
16.04 Complete a job application form correctly.
16.05 Demonstrate competence in job interview techniques.
16.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
16.07 Identify acceptable work habits.
16.08 Demonstrate knowledge of how to make job changes appropriately.
16.09 Demonstrate acceptable employee health habits.

17.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP

17.01 Define entrepreneurship.
17.02 Describe the importance of entrepreneurship to the American economy.
17.03 List the advantages and disadvantages of business ownership.
17.04 Identify the risks involved in ownership of a business.
17.05 Identify the necessary personal characteristics of a successful entrepreneur.
17.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS   EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial   COURSE CREDIT: 1
PROGRAM TITLE: Basic Marine Mechanics   PROGRAM NUMBER: 8751000
COURSE TITLE: Basic Marine Mechanics 1   COURSE NUMBER: 8751010

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing shop practices to industry standards, and demonstrating employability skills.

01.0 PERFORM SHOP PRACTICES TO INDUSTRY STANDARDS--The student will be able to:

01.01 Comply with safety rules and regulations
01.02 Use hand tools safely and properly
01.03 Set up and use power tools safely and properly
01.04 Set up and use precision measuring tools
01.05 Drill and remove broken studs and install helicoils
01.06 Identify threaded fasteners by size, type, thread series, thread classes, material hardness, and compatibility
01.07 Identify and make gaskets and seals
01.08 Read and use parts manuals
01.09 Read, interpret, and apply service manuals
01.10 Locate and match electrical units by their symbols on a wiring diagram

16.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

16.01 Conduct a job search.
16.02 Secure information about a job.
16.03 Identify documents that may be required when applying for a job.
16.04 Complete a job application form correctly.
16.05 Demonstrate competence in job interview techniques.
16.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
16.07 Identify acceptable work habits.
16.08 Demonstrate knowledge of how to make job changes appropriately.
16.09 Demonstrate acceptable employee health habits.

STUDENT PERFORMANCE STANDARDS   EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial   COURSE CREDIT: 1
PROGRAM TITLE: Basic Marine Mechanics   PROGRAM NUMBER: 8751000
COURSE TITLE: Basic Marine Mechanics 2   COURSE NUMBER: 8751020

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for maintaining and repairing basic 4-stroke cycle engines and 2-stroke cycle engin

02.0 MAINTAIN AND REPAIR BASIC 4-STROKE CYCLE ENGINES--The student will be able to:

02.01 Explain the basic principles of the operation of 4-stroke cycle internal combustion engines
02.02 Identify types of 4-stroke cycle engines
02.03 Locate engine serial and model numbers
02.04 Identify engine assemblies and systems
02.05 Diagnose valve and head problems by use of the visual inspection method
02.06 Diagnose valve and head problems by use of the compression tester method
02.07 Diagnose valve and head problems by use of the cylinder air pressure method
02.08 Disassemble engines and inspect parts

02.09 Clean and inspect heads for cracks, warpage, and damaged spark plug threads
02.10 Inspect valves for warpage, burns, cracks, stem wear, tip wear, and margin
02.11 Grind valve seats and reface valves
02.12 Check and inspect springs for free height, distortion, and installed height
02.13 Adjust valve lash
02.14 Move and inspect camshafts and lifters
02.15 Measure camshafts
02.16 Clean and inspect lifters for wear
02.17 Time valve drive assemblies
02.18 Remove pistons from rod assemblies
02.19 Measure out-of-round and cylinder taper with a dial bore gauge or micrometer
02.20 Check piston pins and bosses for wear
02.21 Measure piston ring lands width, out-of-round, and taper
02.22 Measure the piston ring gap in cylinder bores
02.23 Install and fit piston pins
02.24 Check rod and piston assembly alignment
02.25 Remove and replace rod bearings
02.26 Hone and clean cylinders
02.27 Install rings on pistons
02.28 Measure and check crankshafts with a micrometer
02.29 Check for end play
02.30 Check bearing bores with a telescoping gauge
02.31 Reassemble engines
02.32 Install oil seals

03.0 MAINTAIN AND REPAIR BASIC 2-STROKE CYCLE ENGINES--The student will be able to:

03.01 Explain the basic principles of the operation of 2-stroke cycle internal combustion engines
03.02 Identify types of engines
03.03 Locate engine serial and model numbers
03.04 Identify engine assemblies and systems
03.05 Disassemble engines
03.06 Remove, clean, and inspect heads for cracks, warpage, and damaged spark plug threads
03.07 Diagnose head problems by use of the visual inspection method
03.08 Diagnose head problems by use of the compression tester method
03.09 Diagnose head problems by use of the cylinder air pressure method
03.10 Diagnose head problems by use of the stethoscope method
03.11 Remove, clean, and inspect piston rods and assemblies
03.12 Measure out-of-round of pistons and cylinders
03.13 Hone cylinders
03.14 Check the total bearing surface of connecting rod bearings
03.15 Measure piston skirts and ring grooves
03.16 Measure the piston ring gap in cylinder bores
03.17 Install piston pins according to manufacturer's specifications
03.18 Check rod and piston assembly alignment
03.19 Install rings on pistons
03.20 Install piston rod assemblies
03.21 Measure and check crankshafts with a micrometer
03.22 Check needle bearings
03.23 Inspect crankshafts and install seals
03.24 Inspect, clean, and/or replace reed valves
03.25 Reassemble engines

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1987
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Basic Marine Mechanics	PROGRAM NUMBER:	8751000
COURSE TITLE:	Basic Marine Mechanics 3	COURSE NUMBER:	8751030

COURSE DESCRIPTION:

This course is designed to (provide instruction in the different procedures for maintaining and repairing electrical systems, cranking systems and ignition systems.

- 04.0 MAINTAIN AND REPAIR ELECTRICAL SYSTEMS--The student will be able to:
  - 04.01 Set up and use voltmeters, ammeters, and ohmmeters
  - 04.02 Locate and identify electrical circuit components
  - 04.03 Sketch a typical circuit using a single wire system
  - 04.04 Test storage batteries using a hydrometer
  - 04.05 Test storage batteries using a light and load test
  - 04.06 Charge storage batteries
  - 04.07 Remove and replace batteries and service battery boxes
  - 04.08 Repair damaged wire and electrical harnesses
  - 04.09 Diagnose circuit troubles using continuity or a test light and low reading voltmeters to record voltage drop
  - 04.10 Sketch and label typical fuel gauge systems
  - 04.11 Remove and replace ampmeters or indicating lights
  - 04.12 Remove and replace fuel gauges
  - 04.13 Remove and replace fuel sending units
  - 04.14 Diagnose gauges and accessory system troubles using test lights, voltmeters, ampmeters, or detached sending units
  - 04.15 Sketch typical circuits such as those for auto bilge pumps or navigation lights
  - 04.16 Locate opens, shorts, and grounds

- 05.0 MAINTAIN AND REPAIR CRANKING SYSTEMS--The student will be able to:
  - 05.01 Disassemble recoil starters
  - 05.02 Inspect components of recoil starters
  - 05.03 Reassemble recoil starters
  - 05.04 Identify components of electrical starting systems
  - 05.05 Disassemble different types of starting motors
  - 05.06 Bench test armatures
  - 05.07 Bench test field coils
  - 05.08 Bench test drive units
  - 05.09 Bench test switches
  - 05.10 Bench test minor parts of starting motor components
  - 05.11 Use armature lathes for turning commutators
  - 05.12 Install, reassemble, and test new starter parts
  - 05.13 Troubleshoot starting systems using battery-starter testers
  - 05.14 Troubleshoot starting systems using voltmeters for finding excessive voltage drop
  - 05.15 Recondition solenoids, drives, and other components
  - 05.16 Set up and use battery-starter (load) testers
  - 05.17 Locate opens, shorts, and grounds

- 06.0 MAINTAIN AND REPAIR IGNITION SYSTEMS--The student will be able to:
  - 06.01 **Maintain and Repair Magneto Ignition Systems**
  - 06.02 Sketch and label electrical symbols
  - 06.03 Set up and use ohmmeters
  - 06.04 Set up and use voltmeters
  - 06.05 Set up and use ignition testers
  - 06.06 Set up and use ignition analyzers
  - 06.07 Locate and identify parts of magneto ignitions
  - 06.08 Locate and match electrical units by their symbols on a wiring diagram
  - 06.09 Sketch and label complete magneto ignition systems
  - 06.10 Check coil resistance with an ohmmeter
  - 06.11 Check points for continuity and resistance
  - 06.12 Check condensers for capacity, leaks, and shorts
  - 06.13 Clean and regap spark plugs
  - 06.14 **Maintain and Repair Battery Ignition Systems**
  - 06.15 Locate and identify parts of battery ignitions
  - 06.16 Locate and match electrical units by their symbols on a wiring diagram
  - 06.17 Sketch and label complete battery ignition systems
  - 06.18 Check coil resistance with an ohmmeter
  - 06.19 Check points for continuity and resistance

06.20 Check condensers for capacity, leaks, and shorts
06.21 Set up and use test equipment
06.22 Set timing using a timing light
06.23 **Maintain and Repair Capacitor Discharge Ignition Systems**
06.24 Sketch and label electrical symbols
06.25 Set up and use ohmmeters
06.26 Set up and use a CD-77
06.27 Set up and use spark testers
06.28 Set up and use neon test lights
06.29 Set up and use low/high ampmeters
06.30 Set up and use voltmeters
06.31 Locate and identify parts of capacitor discharge ignition systems
06.32 Locate and match electrical units by their symbols on a wiring diagram
06.33 Sketch and label complete C/D ignition systems
06.34 Check coil resistance, shorts, and grounds with an ohmmeter
06.35 Check stator windings with an ohmmeter
06.36 Check sensor coils, charge coils, ignition coils, and shorts to ground with a CD-77
06.37 Check power packs with an ohmmeter and a CD-77

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Basic Marine Mechanics
PROGRAM NUMBER: 8751000

COURSE TITLE: Basic Marine Mechanics 4
COURSE NUMBER: 8751040

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for maintaining and repairing outboard charging systems, fuel systems, and cooling systems.

07.0 MAINTAIN AND REPAIR OUTBOARD CHARGING SYSTEMS--The student will be able to:

07.01 Sketch and label the units of complete charging circuits
07.02 Disassemble charging systems and identify the components
07.03 Perform stator and rectifier testing on charging systems
07.04 Reassemble and test charging systems
07.05 Set up and use ohmmeters
07.06 Test regulators
07.07 Reassemble and test complete units

08.0 MAINTAIN AND REPAIR FUEL SYSTEMS--The student will be able to:

08.01 **Maintain and Repair Fuel Systems**
08.02 Identify and locate fuel system components (fuel tanks, lines, filters, etc.)
08.03 Sketch and label the parts of total fuel systems
08.04 Service fuel lines
08.05 Remove, clean, and install fuel tanks
08.06 Identify and locate fuel pump vacuums
08.07 Remove, replace, service, and check the pressure of fuel pumps
08.08 Remove, clean, and replace in-line filters
08.09 Identify the major types of carburetors
08.10 Check and adjust throttle and governor linkages
08.11 **Maintain and Repair Two-stroke Cycle Carburetors**
08.12 Sketch and label the parts of total fuel systems
08.13 Service fuel lines and primer bulbs (vacuum test)
08.14 Remove, clean, inspect, and install fuel tanks
08.15 Identify basic carburetor circuits (chokes; floats; fuel inlets; idle, intermediate, and high speeds; mains, etc.)
08.16 Identify and locate fuel pumps
08.17 Remove, inspect, and replace fuel pumps

08.18 Remove, clean, overhaul, replace, and make final adjustments to carburetors
08.19 Remove, service, and replace air cleaners
08.20 Diagnose carburetor problems
08.21 Remove, inspect, and replace reed valves and gaskets
08.22 Diagnose exhaust problems such as back pressure and scavenging
08.23 Inspect and service oil metering systems
08.24 Determine and make appropriate fuel-oil mixtures
08.25 **Maintain and Repair Inboard Gas Systems**
08.26 Remove, service, and replace carburetor air cleaners/flame arrestors
08.27 Identify and locate fuel system components (fuel pumps, carburetors and air filters, linkages, and intake manifolds)
08.28 Remove, clean, overhaul, replace, and make final adjustments to carburetors

09.0 MAINTAIN AND REPAIR COOLING SYSTEMS--The student will be able to:

09.01 Explain the principles of cooling systems, including fresh water cooling systems
09.02 Trace water flow through cooling systems
09.03 Disassemble and reassemble water pumps
09.04 Remove, check, and replace thermostats
09.05 Use thermostat pressure relief systems
09.06 Service manifolds, risers, and thermostat housings
09.07 Service water cooling systems for gas inboard, gas outboard, and diesel engines

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STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Basic Marine Mechanics
PROGRAM NUMBER: 8751000

COURSE TITLE: Basic Marine Mechanics 5
COURSE NUMBER: 8751050

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for maintaining and repairing lubrication systems, outdrives, transmissions, and intermediate housings, and the assembly and maintenance of outboard lower units and housing assemblies.

10.0 MAINTAIN AND REPAIR LUBRICATION SYSTEMS--The student will be able to:

10.01 Identify the types and functions of lubrication systems
10.02 Explain the principles of lubrication systems
10.03 Identify and locate components of lubrication systems
10.04 Check engines for oil leaks
10.05 Change engine oil and filters
10.06 Check engine oil pressure and level
10.07 Recognize and use only recommended oil

11.0 MAINTAIN AND REPAIR OUTDRIVES, TRANSMISSIONS, AND INTERMEDIATE HOUSINGS --The student will be able to:

11.01 **Maintain and Repair Intermediate Housings**
11.02 Disassemble main drive shafts
11.03 Shim drive shafts to intermediate housings
11.04 Remove and replace clutch assemblies
11.05 Check electrical components with proper test equipment
11.06 Remove and replace "U" joints
11.07 Disassemble outer transom plates
11.08 Adjust trim and limit switches
11.09 Disassemble cylinder rams
11.10 **Maintain and Repair Stern Drive Upper Gear Case**
11.11 Determine the differences between mechanical, electrical, and hydraulic shifting units
11.12 Disassemble and reassemble each type of shifting unit

11.13 Reshim units to manufacturer's specifications
11.14 Use the proper oil to refill upper and lower gear cases
11.15 **Perform Upper to Lower Gear Case Maintenance**
11.16 Disassemble exhaust housings
11.17 Inspect seals, "O" rings, shafts, and bearings
11.18 Reassemble exhaust housings
11.19 **Maintain and Repair Lower Gear Cases**
11.20 Determine the differences between mechanical, electrical, and hydraulic shifting
11.21 Remove and replace lower gear cases
11.22 Reshim lower gear cases
11.23 Refill lower gear cases with specified oil
11.24 Determine propeller pitch, diameter, and hub type
11.25 **Maintain and Repair Transmissions**
11.26 Inspect planetary clutch plate air coupling assemblies
11.27 Remove and replace transmissions
11.28 Use proper service tools in shimming, reassembly, and testing
11.29 **Lubricate Transmissions**
11.30 Drain transmissions
11.31 Determine capacity using the transmission service manuals
11.32 Refill transmissions according to manufacturer's specifications

12.0 ASSEMBLE AND MAINTAIN OUTBOARD LOWER UNITS AND HOUSING ASSEMBLIES --The student will be able to:

12.01 Disassemble and reassemble steering handle groups
12.02 Disassemble and assemble exhaust housings and water tube assemblies
12.03 Replace motor mounts and shock absorbers
12.04 Lubricate all fittings
12.05 Pressure and vacuum test gear cases
12.06 Remove and test cylinders and rams
12.07 Adjust reverse locks
12.08 Adjust the trim and tilt
12.09 Determine the differences between mechanical, electrical, and hydraulic shifting units
12.10 Explain the shifting theory of the lower unit
12.11 Disassemble and reassemble mechanical shifting units
12.12 Disassemble and reassemble electrical shifting units
12.13 Disassemble and reassemble hydraulic shifting units
12.14 Inspect all parts for wear

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1986

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Marine Mechanics

PROGRAM NUMBER: 8751000

COURSE TITLE: Basic Marine Mechanics 6

COURSE NUMBER: 8751060

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for the proper use of marine woods, metals and fiber glass, the adjustment and repair of trailors, and the proper way to prepare and deliver sales merchandise.

13.0 USE MARINE WOODS, METALS, AND FIBER GLASS--The student will be able to:

13.001 Explain the hazards of a marine environment to woods, metals, and fiber glass
13.002 Explain a galvanic series
13.003 Explain the theory for using given materials in boat repair activities

14.0 ADJUST AND REPAIR TRAILERS--The student will be able to:

14.001 Make boat-to-trailer adjustments
14.002 Remove and replace lighting systems

14.003 Remove and replace wheel bearings and springs
14.004 Remove and replace brakes
14.005 Dissassemble, diagnose, and reassemble trim and tilt systems
14.006 Remove and test cylinder rams
14.007 Adjust reverse locks
14.008 Adust the trim and tilt

15.0 PREPARE AND DELIVER SALES MERCHANDISE--The student will be able to:

15.01 **Install Outboard Motors**
15.02 Make center line measurements
15.03 Center the plate height
15.04 Locate manufacturers' I.D. plates
15.05 **Install Control Boxes**
15.06 Mount control boxes at the helm
15.07 Place wiring and cables in a neat and orderly manner
15.08 **Make Appropriate Adjustments**
15.09 Adjust the control cables from the engine to the control box
15.10 Center the steering cable to the engine
15.11 **Install Accessories**
15.12 Find suitable locations for accessories and mount them to the boat
15.13 Lubricate shafts, install propellers, and fasten both securely
15.14 **Follow and Complete a Servicing Check List**
15.15 Check for proper levels
15.16 Check manufacturers' specifications
15.17 Test-run boats
15.18 Recheck work completed
15.19 **Install Stern Drive Units**
15.20 Check manufacturers' installation procedures
15.21 Lubricate shafts and install propellers securely
15.22 Obtain maximum oil level capacity
15.23 **Prepare Engines**
15.24 Install or connect drain plugs, pet cocks, hose clamps, hoses, etc.
15.25 Find a suitable mount location and mount the engine securely in the boat
15.26 Set engines to manufacturer's specifications
15.27 Set, adjust, and test engines to manufacturer's specifications
15.28 **Install Lighting Systems and Accessories**
15.29 Remove and replace running lights
15.30 Troubleshoot lighting systems and accessories
15.31 Check and adjust throttles, cables, horns, lights, and tachometers

17.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP

17.01 Define entrepreneurship.
17.02 Describe the importance of entrepreneurship to the American economy.
17.03 List the advantages and disadvantages of business ownership.
17.04 Identify the risks involved in ownership of a business.
17.05 Identify the necessary personal characteristics of a successful entrepreneur.
17.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK
PROGRAM AREA: Industrial
FLORIDA DEPARTMENT OF EDUCATION
EFFECTIVE DATE: July, 1987
PROGRAM TITLE: Basic Motorcycle Mechanics
CODE NUMBER: Secondary 8766100 Postsecondary ______
Florida CIP IN47.062601

SECONDARY SCHOOL CREDITS 6
COLLEGE CREDITS ______
POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ______7-9 ______9-12 ______Postsecondary Adult Vocational
______ Postsecondary Vocational x Other 10-12, 21

CERTIFICATION COVERAGE: GASENG RPR 7 MOTORCYCLE 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as motorcycle repairers (620.281-054), motorcycle subassembly repairers (620.684-026), motorcycle subassemblers (806.684-094), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, maintain frames, suspension, wheels and brakes, drive trains and engines, as well as service systems to prevent mechanical failure.

Listed below are the courses that comprise this program when offered at the secondary level:

8766110	Basic Motorcycle Mechanics 1
8766120	Basic Motorcycle Mechanics 2
8766130	Basic Motorcycle Mechanics 3
8766140	Basic Motorcycle Mechanics 4
8766150	Basic Motorcycle Mechanics 5
8766160	Basic Motorcycle Mechanics 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in all systems on motorcycles including electrical, power, drive, fuel and exhaust systems.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student will receive compensation for work performed.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply safety rules and procedures.
02. Utilize hand tools, equipment and materials.
03. Maintain frames and suspension.
04. Maintain wheels and brakes.
05. Maintain drive trains.

Basic Motorcycle Mechanics - Continued

06. Service fuel and exhaust systems.
07. Perform tune-ups.
08. Service electrical systems.
09. Maintain and repair engines.
10. Apply allied trades.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial SECONDARY NUMBER: 8766100

PROGRAM TITLE: Basic Motorcycle Mechanics POSTSECONDARY NUMBER: ________

01.0 APPLY SAFETY RULES AND PROCEDURES--The student will be able to:

01.01 Demonstrate understanding of safety rules.
01.02 Demonstrate understanding of shop and class procedures.

02.0 UTILIZE HAND TOOLS, EQUIPMENT, AND MATERIALS--The student will be able to:

02.01 Identify hand tools.
02.02 Utilize measuring tools.
02.03 Utilize and maintain basic shop equipment.
02.04 Identify and use standard fasteners.
02.05 Identify gaskets and choose sealants.
02.06 Use parts and service manuals.

03.0 MAINTAIN FRAMES AND SUSPENSION--The student will be able to:

03.01 Service and overhaul front suspension.
03.02 Service and overhaul rear suspension.

04.0 MAINTAIN WHEELS AND BRAKES--The student will be able to:

04.01 Remove and replace hub.
04.02 Remove and remount tires.
04.03 Overhaul drum brakes.
04.04 Overhaul hydraulic brakes.

05.0 MAINTAIN DRIVE TRAINS--The student will be able to:

05.01 Replace chain and sprocket.
05.02 Overhaul primary drive.
05.03 Overhaul transmission.
05.04 Service kickstart systems.

06.0 SERVICE FUEL AND EXHAUST SYSTEMS--The student will be able to:

06.01 Identify components and operation of carburetors.
06.02 Diagnose and repair slide type carburetors.
06.03 Diagnose and repair CV type carburetors.
06.04 Diagnose and repair exhaust system.
06.05 Troubleshoot and repair fuel delivery systems.

07.0 PERFORM TUNE-UPS--The student will be able to:

07.01 Diagnose performance problems.
07.02 Adjust valve clearance and cam chain.
07.03 Replace ignition points and timing.
07.04 Adjust carburetor and service fuel delivery systems.
07.05 Tune-up two stroke motorcycles.
07.06 Tune-up single cylinder motorcycles (four-stroke).
07.07 Tune-up multi-cylinder motorcycles (four-stroke).
07.08 Service air filters.
07.09 Service and diagnose storage battery.
07.10 Service lubrication system

08.0 SERVICE ELECTRICAL SYSTEMS--The student will be able to:

08.01 Apply electrical theory.
08.02 Utilize electrical test equipment.
08.03 Read wiring diagram.
08.04 Troubleshoot and repair wire system.
08.05 Troubleshoot and repair battery ignition system.
08.06 Troubleshoot and repair magneto and CDI ignition systems.
08.07 Troubleshoot and repair half-wave and full-wave charging systems.
08.08 Troubleshoot and repair 3-phase charging system.
08.09 Troubleshoot and repair electrical starter system.

09.0 MAINTAIN AND REPAIR ENGINES--The student will be able to:

09.01 Apply engine operating theory.
09.02 Overhaul single cylinder 4-stroke top-end.
09.03 Overhaul multi-cylinder 4-stroke top-end.
09.04 Overhaul two stroke top-end.
09.05 Perform complete overhaul on single cylinder 4-stroke engines.
09.06 Perform complete overhaul on two stroke engine.
09.07 Service and repair water cooling systems.

10.0 APPLY ALLIED TRADES--The student will be able to:

10.01 Utilize oxyactylene welding outfit for heating, welding, brazing and cutting.
10.02 Utilize propane torch for miscellaneous operations.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Basic Motorcycle Mechanics
PROGRAM NUMBER: 8766100
COURSE TITLE: Basic Motorcycle Mechanics 1
COURSE NUMBER: 8766110

COURSE DESCRIPTION:

This course will provide instruction in safety, in the shop/lab, rules and grading procedures, hand and power tools and employability skills.

01.0 APPLY SAFETY RULES AND PROCEDURES--The student will be able to:

01.01 Demonstrate understanding of safety rules.
01.02 Demonstrate understanding of shop and class procedures.

02.0 UTILIZE HAND TOOLS, EQUIPMENT, AND MATERIALS--The student will be able to:

02.01 Identify hand tools.
02.02 Utilize measuring tools.
02.03 Utilize and maintain basic shop equipment.
02.04 Identify and use standard fasteners.
02.05 Identify gaskets and choose sealants.
02.06 Use parts and service manuals.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Basic Motorcycle Mechanics
PROGRAM NUMBER: 8766100
COURSE TITLE: Basic Motorcycle Mechanics 2
COURSE NUMBER: 8766120

COURSE DESCRIPTION:

This course will provide instruction in safety, in the shop/lab experience in maintaining motorcycle frames, suspensions, wheels, and brakes.

03.0 MAINTAIN FRAMES AND SUSPENSION--The student will be able to:

03.01 Service and overhaul front suspension.
03.02 Service and overhaul rear suspension.

04.0 MAINTAIN WHEELS AND BRAKES--The student will be able to:

04.01 Remove and replace hub.
04.02 Remove and remount tires.
04.03 Overhaul drum brakes.
04.04 Overhaul hydraulic brakes.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Basic Motorcycle Mechanics
PROGRAM NUMBER: 8766100

COURSE TITLE: Basic Motorcycle Mechanics 3
COURSE NUMBER: 8766130

COURSE DESCRIPTION:

This course will provide instruction in safety, in the shop/lab experience in motorcycle drive trains, fuel and exhaust systems.

05.0 MAINTAIN DRIVE TRAINS--The student will be able to:

05.01 Replace chain and sprocket.
05.02 Overhaul primary drive.
05.03 Overhaul transmission.
05.04 Service kickstart systems.

06.0 SERVICE FUEL AND EXHAUST SYSTEMS--The student will be able to:

06.01 Identify components and operation of carburetors.
06.02 Diagnose and repair slide type carburetors.
06.03 Diagnose and repair CV type carburetors.
06.04 Diagnose and repair exhaust system.
06.05 Troubleshoot and repair fuel delivery systems.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Basic Motorcycle Mechanics
PROGRAM NUMBER: 8766100

COURSE TITLE: Basic Motorcycle Mechanics 4
COURSE NUMBER: 8766140

COURSE DESCRIPTION:

This course will provide instruction in safety, in the shop/lab experience in motorcycle tune-up to include single and multi-cylinder engines, two and four stroke.

07.0 PERFORM TUNE-UPS--The student will be able to:

07.01 Diagnose performance problems.
07.02 Adjust valve clearance and cam chain.
07.03 Replace ignition points and timing.
07.04 Adjust carburetor and service fuel delivery systems.
07.05 Tune-up two stroke motorcycles.
07.06 Tune-up single cylinder motorcycles (four-stroke).
07.07 Tune-up multi-cylinder motorcycles (four-stroke).
07.08 Service air filters.
07.09 Service and diagnose storage battery.
07.10 Service lubrication system.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Motorcycle Mechanics PROGRAM NUMBER: 8766100

COURSE TITLE: Basic Motorcycle Mechanics 5 COURSE NUMBER: 8766150

COURSE DESCRIPTION:

This course will provide instruction in safety, in the shop/lab experience in electrical system service.

08.0 SERVICE ELECTRICAL SYSTEMS--The student will be able to:

08.01 Apply electrical theory.
08.02 Utilize electrical test equipment.
08.03 Read wiring diagram.
08.04 Troubleshoot and repair wire system.
08.05 Troubleshoot and repair battery ignition system.
08.06 Troubleshoot and repair magneto and CDI ignition systems.
08.07 Troubleshoot and repair half-wave and full-wave charging systems.
08.08 Troubleshoot and repair 3-phase charging system.
08.09 Troubleshoot and repair electrical starter system.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Motorcycle Mechanics PROGRAM NUMBER: 8766100

COURSE TITLE: Basic Motorcycle Mechanics 6 COURSE NUMBER: 8766160

COURSE DESCRIPTION:

This course will provide instruction in safety, in the shop/lab experience in engine repair and maintenance.

09.0 MAINTAIN AND REPAIR ENGINES--The student will be able to:

09.01 Apply engine operating theory.
09.02 Overhaul single cylinder 4-stroke top-end.
09.03 Overhaul multi-cylinder 4-stroke top-end.
09.04 Overhaul two stroke top-end.
09.05 Perform complete overhaul on single cylinder 4-stroke engines.
09.06 Perform complete overhaul on two stroke engine.
09.07 Service and repair water cooling systems.

10.0 APPLY ALLIED TRADES--The student will be able to:

10.01 Utilize oxyactylene welding outfit for heating, welding, brazing and cutting.
10.02 Utilize propane torch for miscellaneous operations.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Basic Precision Machining

CODE NUMBER: Secondary 87540000 Postsecondary ________

Florida CIP IN48.052300

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

___ Postsecondary Vocational X Other 10-12, 21

CERTIFICATION COVERAGE: MACH SHOP 7 METAL WORK @ 7 TOOL DIE @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as filers (705.484-010), buffers (603.382-010), lay out workers (600.281), cut off saw operators (607.682-010), drill press operators (606.682-014), or lathe operators (604.280-010).

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, use of shop math and blueprints to produce machine parts to required size, bench work, precision measurement, and layout.

Listed below are the courses that comprise this program when offered at the secondary level:

8754010	Basic Precision Machining 1
8754020	Basic Precision Machining 2
8754030	Basic Precision Machining 3
8754040	Basic Precision Machining 4
8754050	Basic Precision Machining 5
8754060	Basic Precision Machining 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and include the set-up and operation of power saws, lathes, milling machines, drill presses, and pedestal and surface grinders.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communications, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher, and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfuly completing this program the student will be able to:

01. Perform prerequisite machining skills.
02. Perform bench work skills.
03. Set up and operate power saws.
04. Set up and operate pedestal grinders.
05. Set up and operate drill presses.
06. Set up and operate lathes.
07. Set up and operate milling machines.
08. Set up and operate grinding machines.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8754000

PROGRAM TITLE: Basic Precision Machining POSTSECONDARY NUMBER: ____

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing prerequisite machining skills.

01.0 PERFORM PREREQUISITE MACHINING SKILLS--The student will be able to:

01.01 **Demonstrate Proficiency in Immediate Work Area Maintenance**
01.02 Dispose of scrap metal chips, shavings, trash and waste.
01.03 Clean and maintain work areas affected by operations.
01.04 Leave area in safe condition.
01.05 Comply with shop safety rules and practices.
01.06 Comply with shop operating rules and practices.
01.07 Participate in "clean up" of work and shop areas.
01.08 Maintain a clean and orderly shop.
01.09 **Perform Mathematical Calculations**
01.10 Make job-related decimal and fraction calculations.
01.11 Solve job-related problems by adding, subtracting, multiplying, and dividing numbers.
01.12 Solve job-related problems using a hand-held calculator.
01.13 Solve job-related problems using basic formulas.
01.14 Solve job-related problems using basic geometry.
01.15 Measure a workpiece and compare measurements with blueprint specifications.
01.16 Calculate the amount of material that should be removed to obtain correct limits for secondary operations.
01.17 Solve job-related problems using mathematical handbooks, charts, and tables.
01.18 Convert measurements from English to metric and from metric to English units.
01.19 Determine the clearance, relief, and rake of cutting tools.
01.20 Calculate machine speeds and feeds using appropriate formulas.
01.21 **Demonstrate Proficiency in Blueprint Reading and Machine Planning**
01.22 Interpret view concepts.
01.23 Read lines.
01.24 Read and interpret title blocks.
01.25 Read and interpret change orders on working and assembly prints.
01.26 Read and interpret abbreviations.
01.27 Make shop sketches.
01.28 Read and interpret blueprints, including geometric tolerancing.
01.29 Determine and interpret reference information used in performing machine work.
01.30 Perform layout for precision machine work by using layout instruments.
01.31 Lay out radial and bolt hole circles.
01.32 Inspect, remove, and replace manufactured parts that need repair or machine work.
01.33 Select the most productive tool and tooling for a given operation.
01.34 **Perform Measuring Operations**
01.35 Read and measure with rules and calipers.
01.36 Read and measure with micrometers.
01.37 Read and measure with vernier tools.
01.38 Read and measure with dial indicators.
01.39 Measure with surface plates.
01.40 **Perform Maintenance On Machines and Tools**
01.41 Lubricate equipment parts.
01.42 Clean and store hand tools, cutters, fixtures, jigs, and attachments.
01.43 Inspect and repair hand tools.
01.44 Inspect drive pulleys or belts.
01.45 Select lubricants for machining operations.
01.46 Inspect equipment for safe operational conditions.
01.47 Store grinding wheels.
01.48 Store precision tools.
01.49 Inspect and adjust machine guards.
01.50 Inspect work areas to assure a safe working environment.

02.0 PERFORM BENCH WORK SKILLS--The student will be able to:

02.01 Cut materials by using hand hacksaws.
02.02 Cut threads by using hand taps.
02.03 Cut threads by using dies.
02.04 Ream holes by using hand reamers.
02.05 Hand-sharpen cutting tools by using abrasive stones.
02.06 Hone and lap surfaces.
02.07 Remove damaged screws and other hardware.
02.08 Set up and use arbor press broaches.
02.09 Deburr workpieces.

03.0 SET UP AND OPERATE POWER SAWS--The student will be able to:

03.01 Remove and replace saw blades.
03.02 Select appropriate blades to perform given sawing operations.
03.03 Select and set speeds and feeds for given sawing operations.
03.04 Measure and cut off material using a power saw.
03.05 Saw to scribed lines by using a metal band saw.
03.06 Cut and weld band saw blades to insert for contour sawing.
03.07 Set up and operate saws for angular cutting.

04.0 SET UP AND OPERATE PEDESTAL GRINDERS--The student will be able to:

04.01 Comply with safe and efficient work practices.
04.02 Identify the parts of the machine and explain their use.
04.03 Set up support rests.
04.04 Dress grinding wheels.
04.05 Grind lathe tools to required angles.
04.06 Sharpen drills.

05.0 SET UP AND OPERATE DRILL PRESSES--The student will be able to:

05.01 Identify the parts of the machine and explain their use.
05.02 Identify and set the machine controls.
05.03 Comply with safe and efficient work practices.
05.04 Select the proper tooling.
05.05 Set up for and perform hole work, center drill, drill, ream, counter-sink, counterbore, and power tapping.
05.06 Set drill presses for proper feeds and speeds for specified operations.

06.0 SET UP AND OPERATE LATHES--The student will be able to:

06.01 Identify the parts of the machine and explain their use.
06.02 Comply with general safe and efficient work practices.
06.03 Measure stock.
06.04 Set up an engine lathe.
06.05 Secure tools, tool-holders, and fixtures or attachments.
06.06 Select and set feeds and speeds.
06.07 Set up lathes and face workpieces held in chucks.
06.08 Rough-cut and finish-cut with lathes.
06.09 Perform lathe filing to deburr parts.
06.10 Align lathe centers using accurate methods.
06.11 Drill holes with lathes.
06.12 Countersink holes with lathes.
06.13 Ream holes with lathes.
06.14 Tap threads with lathes.
06.15 Die-cut threads with lathes.
06.16 Counterbore holes with lathes.
06.17 Bore holes with lathes.
06.18 Knurl parts with lathes.
06.19 Cut external threads with lathes.
06.20 Rechase threads with lathes.
06.21 Cut internal threads with lathes.
06.22 Set up and perform taper turning with taper attachments.
06.23 Set up and perform taper turning with the compound.
06.24 Cut internal tapered surfaces.
06.25 Set up and operate tool post grinders.
06.26 Perform contour, angular, or radial cuts with lathes.
06.27 Set up and use follow- and steady-rests.
06.28 Set up face plates and dogs.

07.0 SET UP AND OPERATE MILLING MACHINES--The student will be able to:

- 07.01 Identify the parts of the horizontal and vertical machine and explain their use.
- 07.02 Comply with safe and efficient work practices.
- 07.03 True up the head and align milling machine fixtures.
- 07.04 Select and set feeds and speeds for milling work.
- 07.05 Square up workpieces with a table vise.
- 07.06 Perform end milling.
- 07.07 Perform fly-cutting operations.
- 07.08 Drill holes with milling machines.
- 07.09 Perform reaming operations.
- 07.10 Cut external keyways.
- 07.11 Bore holes with milling machines.
- 07.12 Perform form milling.
- 07.13 Perform indexing operations using a dividing head.
- 07.14 Set up and operate rotary tables.
- 07.15 Mill cylindrical work.
- 07.16 Mill an external radius.
- 07.17 Mill an angle.
- 07.18 Align milling machine attachments.
- 07.19 Mill internal slots with a slotter and attachment.
- 07.20 Perform cutting-off operations.
- 07.21 Set up and perform slab mill operations.
- 07.22 Use an edge finder and wiggler.
- 07.23 Use digital readouts.

08.0 SET UP AND OPERATE GRINDING MACHINES--The student will be able to:

- 08.01 Identify the parts of the machine and explain their use.
- 08.02 Comply with safe and efficient work practices.
- 08.03 Select the proper wheel.
- 08.04 Inspect, balance, dress, and true, grinding wheels.
- 08.05 Attach and align workpieces for grinding operations.
- 08.06 Set up and grind parallel flat surfaces.
- 08.07 Set up and grind four sides square.
- 08.08 Set up and use angle plates.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

- 09.01 Conduct a job search.
- 09.02 Secure information about a job.
- 09.03 Identify documents that may be required when applying for a job.
- 09.04 Complete a job application form correctly.
- 09.05 Demonstrate competence in job interview techniques.
- 09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
- 09.07 Identify acceptable work habits.
- 09.08 Demonstrate knowledge of how to make job changes appropriately.
- 09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

- 10.01 Define entrepreneurship.
- 10.02 Describe the importance of entrepreneurship to the American economy.
- 10.03 List the advantages and disadvantages of business ownership.
- 10.04 Identify the risks involved in ownership of a business.
- 10.05 Identify the necessary personal characteristics of a successful entrepreneur.
- 10.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial COURSE CREDIT: 1
PROGRAM TITLE: Basic Precision Machining PROGRAM NUMBER: 8754000
COURSE TITLE: Basic Precision Machining 1 COURSE NUMBER: 8754010

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing prerequisite machining skills.

01.0 PERFORM PREREQUISITE MACHINING SKILLS--The student will be able to:

01.01 **Demonstrate Proficiency in Immediate Work Area Maintenance**
01.02 Dispose of scrap metal chips, shavings, trash and waste.
01.03 Clean and maintain work areas affected by operations.
01.04 Leave area in safe condition.
01.05 Comply with shop safety rules and practices.
01.06 Comply with shop operating rules and practices.
01.07 Participate in "clean up" of work and shop areas.
01.08 Maintain a clean and orderly shop.
01.09 **Perform Mathematical Calculations**
01.10 Make job-related decimal and fraction calculations.
01.11 Solve job-related problems by adding, subtracting, multiplying, and dividing numbers.
01.12 Solve job-related problems using a hand-held calculator.
01.13 Solve job-related problems using basic formulas.
01.14 Solve job-related problems using basic geometry.
01.15 Measure a workpiece and compare measurements with blueprint specifications.
01.16 Calculate the amount of material that should be removed to obtain correct limits for secondary operations.
01.17 Solve job-related problems using mathematical handbooks, charts, and tables.
01.18 Convert measurements from English to metric and from metric to English units.
01.19 Determine the clearance, relief, and rake of cutting tools.
01.20 Calculate machine speeds and feeds using appropriate formulas.
01.21 **Demonstrate Proficiency in Blueprint Reading and Machine Planning**
01.22 Interpret view concepts.
01.23 Read lines.
01.24 Read and interpret title blocks.
01.25 Read and interpret change orders on working and assembly prints.
01.26 Read and interpret abbreviations.
01.27 Make shop sketches.
01.28 Read and interpret blueprints, including geometric tolerancing.
01.29 Determine and interpret reference information used in performing machine work.
01.30 Perform layout for precision machine work by using layout instruments.
01.31 Lay out radial and bolt hole circles.
01.32 Inspect, remove, and replace manufactured parts that need repair or machine work.
01.33 Select the most productive tool and tooling for a given operation.
01.34 **Perform Measuring Operations**
01.35 Read and measure with rules and calipers.
01.36 Read and measure with micrometers.
01.37 Read and measure with vernier tools.
01.38 Read and measure with dial indicators.
01.39 Measure with surface plates.
01.40 **Perform Maintenance On Machines and Tools**
01.41 Lubricate equipment parts.
01.42 Clean and store hand tools, cutters, fixtures, jigs, and attachments.
01.43 Inspect and repair hand tools.
01.44 Inspect drive pulleys or belts.
01.45 Select lubricants for machining operations.
01.46 Inspect equipment for safe operational conditions.
01.47 Store grinding wheels.
01.48 Store precision tools.
01.49 Inspect and adjust machine guards.
01.50 Inspect work areas to assure a safe working environment.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Precision Machining PROGRAM NUMBER: 8754000

COURSE TITLE: Basic Precision Machining 2 COURSE NUMBER: 8754020

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing bench work skills and in setting up and operating power saws.

02.0 PERFORM BENCH WORK SKILLS--The student will be able to:

02.01 Cut materials by using hand hacksaws.
02.02 Cut threads by using hand taps.
02.03 Cut threads by using dies.
02.04 Ream holes by using hand reamers.
02.05 Hand-sharpen cutting tools by using abrasive stones.
02.06 Hone and lap surfaces.
02.07 Remove damaged screws and other hardware.
02.08 Set up and use arbor press broaches.
02.09 Deburr workpieces.

03.0 SET UP AND OPERATE POWER SAWS--The student will be able to:

03.01 Remove and replace saw blades.
03.02 Select appropriate blades to perform given sawing operations.
03.03 Select and set speeds and feeds for given sawing operations.
03.04 Measure and cut off material using a power saw.
03.05 Saw to scribed lines by using a metal band saw.
03.06 Cut and weld band saw blades to insert for contour sawing.
03.07 Set up and operate saws for angular cutting.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Precision Machining PROGRAM NUMBER: 8754000

COURSE TITLE: Basic Precision Machining 3 COURSE NUMBER: 8754030

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for setting up and operating pedestal grinders and drill presses.

04.0 SET UP AND OPERATE PEDESTAL GRINDERS--The student will be able to:

04.01 Comply with safe and efficient work practices.
04.02 Identify the parts of the machine and explain their use.
04.03 Set up support rests.
04.04 Dress grinding wheels.
04.05 Grind lathe tools to required angles.
04.06 Sharpen drills.

05.0 SET UP AND OPERATE DRILL PRESSES--The student will be able to:

05.01 Identify the parts of the machine and explain their use.
05.02 Identify and set the machine controls.
05.03 Comply with safe and efficient work practices.
05.04 Select the proper tooling.
05.05 Set up for and perform hole work, center drill, drill, ream, counter-sink, counterbore, and power tapping.
05.06 Set drill presses for proper feeds and speeds for specified operations.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Basic Precision Machining — PROGRAM NUMBER: 8754000

COURSE TITLE: Basic Precision Machining 4 — COURSE NUMBER: 8754040

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for setting up and operating lathes.

06.0 SET UP AND OPERATE LATHES--The student will be able to:

- 06.01 Identify the parts of the machine and explain their use.
- 06.02 Comply with general safe and efficient work practices.
- 06.03 Measure stock.
- 06.04 Set up an engine lathe.
- 06.05 Secure tools, tool-holders, and fixtures or attachments.
- 06.06 Select and set feeds and speeds.
- 06.07 Set up lathes and face workpieces held in chucks.
- 06.08 Rough-cut and finish-cut with lathes.
- 06.09 Perform lathe filing to deburr parts.
- 06.10 Align lathe centers using accurate methods.
- 06.11 Drill holes with lathes.
- 06.12 Countersink holes with lathes.
- 06.13 Ream holes with lathes.
- 06.14 Tap threads with lathes.
- 06.15 Die-cut threads with lathes.
- 06.16 Counterbore holes with lathes.
- 06.17 Bore holes with lathes.
- 06.18 Knurl parts with lathes.
- 06.19 Cut external threads with lathes.
- 06.20 Rechase threads with lathes.
- 06.21 Cut internal threads with lathes.
- 06.22 Set up and perform taper turning with taper attachments.
- 06.23 Set up and perform taper turning with the compound.
- 06.24 Cut internal tapered surfaces.
- 06.25 Set up and operate tool post grinders.
- 06.26 Perform contour, angular, or radial cuts with lathes.
- 06.27 Set up and use follow- and steady-rests.
- 06.28 Set up face plates and dogs.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Basic Precision Machining — PROGRAM NUMBER: 8754000

COURSE TITLE: Basic Precision Machining 5 — COURSE NUMBER: 8754050

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for setting up and operating milling machines.

07.0 SET UP AND OPERATE MILLING MACHINES--The student will be able to:

- 07.01 Identify the parts of the horizontal and vertical machine and explain their use.
- 07.02 Comply with safe and efficient work practices.
- 07.03 True up the head and align milling machine fixtures.
- 07.04 Select and set feeds and speeds for milling work.
- 07.05 Square up workpieces with a table vise.
- 07.06 Perform end milling.
- 07.07 Perform fly-cutting operations.
- 07.08 Drill holes with milling machines.
- 07.09 Perform reaming operations.
- 07.10 Cut external keyways.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Basic Sheet Metal

CODE NUMBER: Secondary 8754100 Postsecondary ______

Florida CIP IN48.052600

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 10-12, 21

CERTIFICATION COVERAGE: SHEETMETAL 7 METAL WORK @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as shear setters (615.380-010), machine helpers (619.687-014), cupboard builders (703.684-014), template cutters (703,684-018), sheet metal workers (804.281-010).

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the layout, fabrication, erection, or installation and maintenance of items made of sheet steel, copper, stainless steel and aluminum using hand tools and machines.

Listed below are the courses that comprise this program when offered at the secondary level:

8754110	Basic Sheet Metal 1
8754120	Basic Sheet Metal 2
8754130	Basic Sheet Metal 3
8754140	Basic Sheet Metal 4
8754150	Basic Sheet Metal 5
8754160	Basic Sheet Metal 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in layout, cutting, forming, fabricating and installing mechanical, architectural, and specialty metal products.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate understanding of procedures and trade safety practices.
02. Read blueprints.
03. Layout sheet metal.
04. Fabricate mechanical systems.

05. Fabricate architectural/roofing sheet metal.
06. Fabricate specialty sheet metal.
07. Fabricate food and beverage dispensing equipment.
08. Weld sheet metal.
09. Install mechanical systems.
10. Install architectural/roofing sheet metal.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARD
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
SECONDARY NUMBER: 8754100
PROGRAM TITLE: Basic Sheet Metal
POSTSECONDARY NUMBER: ________

01.0 DEMONSTRATE UNDERSTANDING OF PROCEDURES AND TRADE SAFETY PRACTICES--The student will be able to:

01.01 Apply safety rules and procedures.
01.02 Explain school/class procedures.
01.03 Demonstrate use and care of tools.

02.0 READ BLUEPRINTS--The student will be able to:

02.01 Interpret detail drawings.
02.02 Read symbols.
02.03 List materials for fabrication from blueprints.
02.04 Develop shop drawings.

03.0 LAYOUT SHEET METAL--The student will be able to:

03.01 Lay out rectangular straight duct.
03.02 Lay out rectangular square throat and square heel duct elbow.
03.03 Lay out rectangular duct ogee offset.
03.04 Lay out rectangular taper duct (centerline taper).
03.05 Lay out rectangular duct Y branch.
03.06 Lay out round straight duct.
03.07 Lay out round duct elbow.
03.08 Lay out round duct Y branch.
03.09 Lay out round duct offset.
03.10 Lay out round duct taper (transitional).
03.11 Lay out round duct lateral (round tap).
03.12 Lay out batten seam metal roof panel and cap.
03.13 Lay out square happer.
03.14 Lay out belt guard.

04.0 FABRICATE MECHANICAL SYSTEMS--The student will be able to:

04.01 Fabricate rectangular radius throat and radius heel duct elbow.
04.02 Fabricate rectangular square throat and square heel duct elbow.
04.03 Fabricate rectangular duct ogee offset.
04.04 Fabricate rectangular duct transition.
04.05 Fabricate rectangular duct Y branch.
04.06 Fabricate rectangular shoe tap.
04.07 Fabricate round straight duct.
04.08 Fabricate round duct elbow.
04.09 Fabricate round duct Y branch.
04.10 Fabricate round duct offset.
04.11 Fabricate round duct taper (transitional).
04.12 Fabricate round duct lateral (round tap).
04.13 Fabricate round saddle tap.
04.14 Fabricate single wall equipment casing/housing.
04.15 Fabricate flat S.
04.16 Fabricate bar S.
04.17 Fabricate drive cleat.
04.18 Fabricate pocket government lock.
04.19 Fabricate companion angle.
04.20 Fabricate flanged duct section.

05.0 FABRICATE ARCHITECTURAL/ROOFING SHEET METAL--The student will be able to:

05.01 Fabricate batten seam metal roof panel and cap.
05.02 Fabricate standing seam metal roof panel.
05.03 Fabricate metal flat-lock roof panel.
05.04 Fabricate ogee gutter.
05.05 Fabricate half-round gutter.
05.06 Fabricate rectangular downspout/conductor.
05.07 Fabricate offset in rectangular downspout/conductor.
05.08 Fabricate conductor head.
05.09 Fabricate flashing.
05.10 Fabricate roof coping.
05.11 Fabricate gravel stop fascia.
05.12 Fabricate metal siding panel.
05.13 Fabricate louver.
05.14 Fabricate metal ceiling panel.

06.0 FABRICATE SPECIALITY SHEET METAL--The student will be able to:

06.01 Fabricate rectangular single blade damper in frame.
06.02 Fabricate rectangular tube.
06.03 Fabricate round tube.
06.04 Fabricate hollow metal letter.
06.05 Fabricate round duct support saddle (floor mounted).
06.06 Fabricate belt guard.
06.07 Fabricate blind/drapery pocket (cornice).

07.0 FABRICATE FOOD AND BEVERAGE DISPENSING EQUIPMENT--The student will be able to:

07.01 Fabricate counter top.
07.02 Fabricate shelf.
07.03 Fabricate cabinet shell.
07.04 Fabricate cabinet drawer.
07.05 Fabricate cabinet sliding door.

08.0 WELD SHEET METAL--The student will be able to:

08.01 Weld aluminum with gas tungsten arc welding (GTAW) equipment.
08.02 Weld aluminum with gas metal arc welding (GMAW) equipment.
08.03 Weld stainless steel with gas metal arc welding (GMAW) equipment.
08.04 Weld stainless steel with shielded metal arc welding (SMAW) equipment.
08.05 Weld stainless steel with gas tunsten arc welding (GTAW) equipment.
08.06 Weld galvanized steel with carbon arc welding (CAW) equipment.
08.07 Braze galvanized steel.
08.08 Grind and polish metal.
08.09 Solder galvanized steel/copper/stainless steel.

09.0 INSTALL MECHANICAL SYSTEMS--The student will be able to:

09.01 Install rectangular duct system.
09.02 Install round duct system.
09.03 Install single wall equipment casing/housing.

10.0 INSTALL ARCHITECTURAL/ROOFING SHEET METAL

10.01 Install batten seam metal roof panel and cap.
10.02 Install standing seam metal roof panel.
10.03 Install metal flat-lock roof panel.
10.04 Install ogee gutter.
10.05 Install half-round gutter.
10.06 Install rectangular downspout/conductor.
10.07 Install offset in rectangular downspout/conductor.
10.08 Install conductor head.
10.09 Install flashing.
10.10 Install coping.
10.11 Install gravel stop fascia.
10.12 Install metal siding.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Basic Sheet Metal
PROGRAM NUMBER: 8754100
COURSE TITLE: Basic Sheet Metal 1
COURSE NUMBER: 8754110

COURSE DESCRIPTION:

This course is designed to provide an introduction to basic safety rules and procedures, school and classroom/lab procedures and the basic use and care of sheet metal hand tools. Students will be provided instruction in blueprint reading, interpreting drawings, reading symbols, testing materials and developing shop drawings.

01.0 DEMONSTRATE UNDERSTANDING OF PROCEDURES AND TRADE SAFETY PRACTICES--The student will be able to:

01.01 Apply safety rules and procedures.
01.02 Explain school/class procedures.
01.03 Demonstrate use and care of tools.

02.0 READ BLUEPRINTS--The student will be able to:

02.01 Interpret detail drawings.
02.02 Read symbols.
02.03 List materials for fabrication from blueprints.
02.04 Develop shop drawings.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Basic Sheet Metal
PROGRAM NUMBER: 8754100
COURSE TITLE: Basic Sheet Metal 2
COURSE NUMBER: 8754120

COURSE DESCRIPTION:

This course is designed to provide basic competencies in sheet metal layout as well as the basic competencies required in mechanical systems fabrication.

03.0 LAYOUT SHEET METAL--The student will be able to:

03.01 Lay out rectangular straight duct.

03.02 Lay out rectangular square throat and square heel duct elbow.
03.03 Lay out rectangular duct ogee offset.
03.04 Lay out rectangular taper duct (centerline taper).
03.05 Lay out rectangular duct Y branch.
03.06 Lay out round straight duct.
03.07 Lay out round duct elbow.
03.08 Lay out round duct Y branch.
03.09 Lay out round duct offset.
03.10 Lay out round duct taper (transitional).
03.11 Lay out round duct lateral (round tap).
03.12 Lay out batten seam metal roof panel and cap.
03.13 Lay out square happer.
03.14 Lay out belt guard.

04.0 FABRICATE MECHANICAL SYSTEMS--The student will be able to:

04.01 Fabricate rectangular radius throat and radius heel duct elbow.
04.02 Fabricate rectangular square throat and square heel duct elbow.
04.03 Fabricate rectangular duct ogee offset.
04.04 Fabricate rectangular duct transition.
04.05 Fabricate rectangular duct Y branch.
04.06 Fabricate rectangular shoe tap.
04.07 Fabricate round straight duct.
04.08 Fabricate round duct elbow.
04.09 Fabricate round duct Y branch.
04.10 Fabricate round duct offset.
04.11 Fabricate round duct taper (transitional).
04.12 Fabricate round duct lateral (round tap).
04.13 Fabricate round saddle tap.
04.14 Fabricate single wall equipment casing/housing.
04.15 Fabricate flat S.
04.16 Fabricate bar S.
04.17 Fabricate drive cleat.
04.18 Fabricate pocket government lock.
04.19 Fabricate companion angle.
04.20 Fabricate flanged duct section.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Basic Sheet Metal
PROGRAM NUMBER: 8754100

COURSE TITLE: Basic Sheet Metal 3
COURSE NUMBER: 8754130

COURSE DESCRIPTION:

This course is designed to provide instruction in architectural/roofing sheet metal fabrication and instruction in specialty sheet metal fabrication.

05.0 FABRICATE ARCHITECTURAL/ROOFING SHEET METAL--The student will be able to:

05.01 Fabricate batten seam metal roof panel and cap.
05.02 Fabricate standing seam metal roof panel.
05.03 Fabricate metal flat-lock roof panel.
05.04 Fabricate ogee gutter.
05.05 Fabricate half-round gutter.
05.06 Fabricate rectangular downspout/conductor.
05.07 Fabricate offset in rectangular downspout/conductor.
05.08 Fabricate conductor head.
05.09 Fabricate flashing.
05.10 Fabricate roof coping.
05.11 Fabricate gravel stop fascia.
05.12 Fabricate metal siding panel.
05.13 Fabricate louver.
05.14 Fabricate metal ceiling panel.Basic Sheet Metal - Continued

06.0 FABRICATE SPECIALITY SHEET METAL--The student will be able to:

06.01 Fabricate rectangular single blade damper in frame.
06.02 Fabricate rectangular tube.
06.03 Fabricate round tube.

Basic Sheet Metal 3 - Continued

06.04 Fabricate hollow metal letter.
06.05 Fabricate round duct support saddle (floor mounted).
06.06 Fabricate belt guard.
06.07 Fabricate blind/drapery pocket (cornice).

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1987
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Basic Sheet Metal	PROGRAM NUMBER:	8754100
COURSE TITLE:	Basic Sheet Metal 4	COURSE NUMBER:	8754140

COURSE DESCRIPTION:

This course is designed to provide instruction in fabricating food and beverage dispensing equipment and introduction of basic competencies required in sheet metal welding including aluminum/gas tungsten arc, stainless steel/arc, gas-tungsten, carbon arc and brazing, grinding, soldering and polishing metal.

07.0 FABRICATE FOOD AND BEVERAGE DISPENSING EQUIPMENT--The student will be able to:

07.01 Fabricate counter top.
07.02 Fabricate shelf.
07.03 Fabricate cabinet shell.
07.04 Fabricate cabinet drawer.
07.05 Fabricate cabinet sliding door.

08.0 WELD SHEET METAL--The student will be able to:

08.01 Weld aluminum with gas tungsten arc welding (GTAW) equipment.
08.02 Weld aluminum with gas metal arc welding (GMAW) equipment.
08.03 Weld stainless steel with gas metal arc welding (GMAW) equipment.
08.04 Weld stainless steel with shielded metal arc welding (SMAW) equipment.
08.05 Weld stainless steel with gas tunsten arc welding (GTAW) equipment.
08.06 Weld galvanized steel with carbon arc welding (CAW) equipment.
08.07 Braze galvanized steel.
08.08 Grind and polish metal.
08.09 Solder galvanized steel/copper/stainless steel.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1987
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Basic Sheet Metal	PROGRAM NUMBER:	8754100
COURSE TITLE:	Basic Sheet Metal 5	COURSE NUMBER:	8754150

COURSE DESCRIPTION:

This course is designed to provide instruction in the basic competencies required in the installation of sheet metal systems.

09.0 INSTALL MECHANICAL SYSTEMS--The student will be able to:

09.01 Install rectangular duct system.
09.02 Install round duct system.
09.03 Install single wall equipment casing/housing.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Basic Sheet Metal — PROGRAM NUMBER: 8754100

COURSE TITLE: Basic Sheet Metal 6 — COURSE NUMBER: 8754160

COURSE DESCRIPTION:

This course is designed to provide the student with an opportunity to develop competencies in the installation of architectural/roofing systems.

10.0 INSTALL ARCHITECTURAL/ROOFING SHEET METAL

10.01 Install batten seam metal roof panel and cap.
10.02 Install standing seam metal roof panel.
10.03 Install metal flat-lock roof panel.
10.04 Install ogee gutter.
10.05 Install half-round gutter.
10.06 Install rectangular downspout/conductor.
10.07 Install offset in rectangular downspout/conductor.
10.08 Install conductor head.
10.09 Install flashing.
10.10 Install coping.
10.11 Install gravel stop fascia.
10.12 Install metal siding.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Basic Upholstery

CODE NUMBER: Secondary 8775000 Postsecondary ______

Florida CIP IN48.030302

SECONDARY SCHOOL CREDITS 6

COLLEGE CREDITS ______

POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 10-12, 21

CERTIFICATION COVERAGE: FURN REPR 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as furniture upholsterers (50144601), upholstery shop helpers, (780.687-054), furniture upholsterers (780.381-018).

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, preparation of furniture for reupholstering, making patterns and coverings and trimming upholstered items.

Listed below are the courses that comprise this program when offered at the secondary level:

8775010	Basic Upholstery 1
8775020	Basic Upholstery 2
8775030	Basic Upholstery 3
8775040	Basic Upholstery 4
8775050	Basic Upholstery 5
8775060	Basic Upholstery 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the use of power machines and hand tools in cutting, sewing, and re-upholstering activities.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Use trade skills.
02. Maintain and operate power machines.
03. Use upholstery skills.
04. Perform management skills.
05. Make and use patterns.
06. Prepare furniture for reupholstering.
07. Reupholster simple upholstered items.
08. Demonstrate employability skills.
09. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS | EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education | SECONDARY NUMBER: 8775000

PROGRAM TITLE: Basic Upholstery | POSTSECONDARY NUMBER: ______

01.0 USE TRADE SKILLS--The student will be able to:

01.01 Identify furniture styles.
01.02 Use upholstery terminology.
01.03 Use upholstery tools.
01.04 Maintain the shop.

02.0 MAINTAIN AND OPERATE POWER MACHINES--The student will be able to:

02.01 Operate and maintain domestic sewing machines.
02.02 Operate and maintain straight needle machines.
02.03 Operate and maintain walking foot machines.
02.04 Operate and maintain foam grinder.
02.05 Operate and maintain cushion stuffers.
02.06 Operate and maintain steam machines.

03.0 USE UPHOLSTERY SKILLS--The student will be able to:

03.01 Reconstruct deck with coil springs.
03.02 Reconstruct deck with zig-zag springs.
03.03 Reconstruct deck with rubber webbing.
03.04 Construct standard back.
03.05 Construct a loose pillow back.

04.0 PERFORM MANAGEMENT SKILLS--The student will be able to:

04.01 Estimate cost and completion time.
04.02 Complete a work order.
04.03 Perform shop foreman duties.
04.04 Take inventory.

05.0 MAKE AND USE PATTERNS--The student will be able to:

05.01 Estimate fabric needed for final cover.
05.02 Mark pattern on fabric.
05.03 Cut out marked fabric.

06.0 PREPARE FURNITURE FOR REUPHOLSTERING--The student will be able to:

06.01 Strip furniture to frame.
06.02 Repair frame.
06.03 Construct decorative items.
06.04 Repair/refinish exposed wood surfaces.

07.0 REUPHOLSTER SIMPLE UPHOLSTERED ITEMS--The student will be able to:

07.01 Cover inside arms and/or wings.
07.02 Cover outside arms and/or wings.
07.03 Cover outside backs.
07.04 Construct a ruffled skirt.
07.05 Construct a pleated skirt.
07.06 Construct a lined-tailored skirt.
07.07 Attach cambric.
07.08 Construct a box cushion cover.
07.09 Construct a "T" cushion cover.
07.10 Construct a knife edge cushion cover.
07.11 Construct a pleated cushion cover.

08.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

08.01 Conduct a job search.
08.02 Secure information about a job.
08.03 Identify documents which may be required when applying for a job interview.
08.04 Complete a job application form correctly.
08.05 Demonstrate competence in job interview techniques.
08.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
08.07 Identify acceptable work habits.

08.08 Demonstrate knowledge of how to make job changes appropriately.
08.09 Demonstrate acceptable employee health habits.

09.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

09.01 Define entrepreneurship.
09.02 Describe the importance of entrepreneurship to the American economy.
09.03 List the advantages and disadvantages of business ownership.
09.04 Identify the risks involved in ownership of a business.
09.05 Identify the necessary personal characteristics of a successful entrepreneur.
09.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Upholstery PROGRAM NUMBER: 8775000

COURSE TITLE: Basic Upholstery 1 COURSE NUMBER: 8775010

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in trade and employability skills.

01.0 USE TRADE SKILLS--The student will be able to:

01.01 Identify furniture styles.
01.02 Use upholstery terminology.
01.03 Use upholstery tools.
01.04 Maintain the shop.

08.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

08.01 Conduct a job search.
08.02 Secure information about a job.
08.03 Identify documents which may be required when applying for a job interview.
08.04 Complete a job application form correctly.
08.05 Demonstrate competence in job interview techniques.
08.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
08.07 Identify acceptable work habits.
08.08 Demonstrate knowledge of how to make job changes appropriately.
08.09 Demonstrate acceptable employee health habits.

09.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

09.01 Define entrepreneurship.
09.02 Describe the importance of entrepreneurship to the American economy.
09.03 List the advantages and disadvantages of business ownership.
09.04 Identify the risks involved in ownership of a business.
09.05 Identify the necessary personal characteristics of a successful entrepreneur.
09.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Basic Upholstery PROGRAM NUMBER: 8775000

COURSE TITLE: Basic Upholstery 2 COURSE NUMBER: 8775020

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in operating and maintaining power machines.

02.0 MAINTAIN AND OPERATE POWER MACHINES--The student will be able to:

02.01 Operate and maintain domestic sewing machines.
02.02 Operate and maintain straight needle machines.
02.03 Operate and maintain walking foot machines.
02.04 Operate and maintain foam grinder.
02.05 Operate and maintain cushion stuffers.
02.06 Operate and maintain steam machines.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial — COURSE CREDIT: 1
PROGRAM TITLE: Basic Upholstery — PROGRAM NUMBER: 8775000
COURSE TITLE: Basic Upholstery 3 — COURSE NUMBER: 8775030

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in upholstery skills.

03.0 USE UPHOLSTERY SKILLS--The student will be able to:

03.01 Reconstruct deck with coil springs.
03.02 Reconstruct deck with zig-zag springs.
03.03 Reconstruct deck with rubber webbing.
03.04 Construct standard back.
03.05 Construct a loose pillow back.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial — COURSE CREDIT: 1
PROGRAM TITLE: Basic Upholstery — PROGRAM NUMBER: 8775000
COURSE TITLE: Basic Upholstery 4 — COURSE NUMBER: 8775040

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in management and pattern skills.

04.0 PERFORM MANAGEMENT SKILLS--The student will be able to:

04.01 Estimate cost and completion time.
04.02 Complete a work order.
04.03 Perform shop foreman duties.
04.04 Take inventory.

05.0 MAKE AND USE PATTERNS--The student will be able to:

05.01 Estimate fabric needed for final cover.
05.02 Mark pattern on fabric.
05.03 Cut out marked fabric.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial — COURSE CREDIT: 1
PROGRAM TITLE: Basic Upholstery — PROGRAM NUMBER: 8775000
COURSE TITLE: Basic Upholstery 5 — COURSE NUMBER: 8775050

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in constructing furniture foundations.

06.0 PREPARE FURNITURE FOR REUPHOLSTERING--The student will be able to:

06.01 Strip furniture to frame.
06.02 Repair frame.
06.03 Construct decorative items.
06.04 Repair/refinish exposed wood surfaces.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Basic Upholstery

PROGRAM NUMBER: 8775000

COURSE TITLE: Basic Upholstery 6

COURSE NUMBER: 8775060

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in constructing cushion and wood furniture touch-up and repair.

07.0 REUPHOLSTERY SIMPLE UPHOLSTERED ITEMS--The student will be able to:

07.01 Cover inside arms and/or wings.
07.02 Cover outside arms and/or wings.
07.03 Cover outside backs.
07.04 Construct a ruffled skirt.
07.05 Construct a pleated skirt.
07.06 Construct a lined-tailored skirt.
07.07 Attach cambric.
07.08 Construct a box cushion cover.
07.09 Construct a "T" cushion cover.
07.10 Construct a knife edge cushion cover.
07.11 Construct a pleated cushion cover.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Basic Welding

CODE NUMBER: Secondary 8754200 Postsecondary ______

Florida CIP IN48.052800

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 10-12, 21

CERTIFICATION COVERAGE: WELDING 7 METTALLURGY @ 7 METAL WORK @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as welders and flame cutters (61022002), production line welders (819.684-010), welder assemblers (819.381-010), arc cutters (816.364-010), welder helpers (819.687-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, reading blueprints, identifying metals, basic shop skills, gas welding skills, shielded metal arc welding skills, and shielded gas arc welding skills.

Listed below are the courses that comprise this program when offered at the secondary level:

8754210	Basic Welding 1
8754220	Basic Welding 2
8754230	Basic Welding 3
8754240	Basic Welding 4
8754250	Basic Welding 5
8754260	Basic Welding 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in blueprint reading, gas welding, shielded metal arc welding and shielded gas arc welding.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply basic shop skills.
02. Read blueprints.
03. Identify metals.
04. Apply gas welding skills.
05. Apply shielded metal arc welding skills (SMAW).
06. Apply shielded gas arc welding skills (GTAW).
07. Demonstrate employability skills.
08. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
PROGRAM AREA: Industrial
PROGRAM TITLE: Basic Welding

EFFECTIVE DATE: July, 1987
SECONDARY NUMBER: 8754200
POSTSECONDARY NUMBER: _______

01.0 APPLY BASIC SHOP SKILLS--The student will be able to:

01.01 Apply communications and leadership skills.
01.02 Apply safety practices.
01.03 Apply measuring skills.
01.04 Apply cutting skills.
01.05 Apply bending skills.
01.06 Apply drilling skills.
01.07 Apply punching skills.
01.08 Apply finishing skills.

02.0 READ BLUEPRINTS--The student will be able to:

02.01 Interpret detail drawings.
02.02 List materials for fabrication from blueprint.
02.03 Develop shop drawings.

03.0 IDENTIFY METALS--The student will be able to:

03.01 Identify metals by appearance and weight.
03.02 Identify materials by spark test.
03.03 Classify metals by magnetic properties.

04.0 APPLY GAS WELDING SKILLS--The student will be able to:

04.01 Set up oxy-fuel equipment.
04.02 Cut carbon steel using oxy-fuel equipment.
04.03 Run beads with gas welding equipment.
04.04 Gas weld carbon steel joints.

05.0 APPLY SHIELDED METAL ARC WELDING SKILLS (SMAW)--The student will be able to:

05.01 Run beads with SMAW equipment.
05.02 Apply surfacing skills.
05.03 Weld single pass and multiple pass lap joints.
05.04 Weld outside corner joints.
05.05 Weld multiple pass "tee" joints in all positions.

06.0 APPLY SHIELDED GAS ARC WELDING SKILLS (GTAW), (GMAW), AND (FCAW)--The student will be able to:

06.01 Assemble GTAW equipment (TIG).
06.02 Run beads with GTAW equipment.
06.03 Weld aluminum joints with GTAW equipment.
06.04 Weld mild steel joints with GTAW equipment.
06.05 Weld stainless steel joints with GTAW equipment.
06.06 Run beads with GMAW equipment (MIG).
06.07 Weld mild steel joints with GMAW equipment.

07.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

07.01 Conduct a job search.
07.02 Secure information about a job.
07.03 Identify documents which may be required when applying for a job interview.
07.04 Complete a job application form correctly.
07.05 Demonstrate competence in job interview techniques.
07.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
07.07 Identify acceptable work habits.
07.08 Demonstrate knowledge of how to make job changes appropriately.
07.09 Demonstrate acceptable employee health habits.

08.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

08.01 Define entrepreneurship.
08.02 Describe the importance of entrepreneurship to the American economy.
08.03 List the advantages and disadvantages of business ownership.
08.04 Identify the risks involved in ownership of a business.
08.05 Identify the necessary personal characteristics of a successful entrepreneur.
08.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Basic Welding
PROGRAM NUMBER: 8754200
COURSE TITLE: Basic Welding 1
COURSE NUMBER: 8754210

COURSE DESCRIPTION:

This course is designed to provide instruction of safety rules and regulations concerning tool, equipment, and class procedures, the use of welding practices and equipment, cutting bending, drilling and finishing of metal, measuring skills, communication and leadership skills as they apply to the welding industries.

01.0 APPLY BASIC SHOP SKILLS--The student will be able to:

01.01 Apply communications and leadership skills.
01.02 Apply safety practices.
01.03 Apply measuring skills.
01.04 Apply cutting skills.
01.05 Apply bending skills.
01.06 Apply drilling skills.
01.07 Apply punching skills.
01.08 Apply finishing skills.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Basic Welding
PROGRAM NUMBER: 8754200
COURSE TITLE: Basic Welding 2
COURSE NUMBER: 8754220

COURSE DESCRIPTION:

This course is designed to provide instruction in the interpretation of detail drawings and how they apply to welding, determine types of metals needed, develop shop drawings of desired work, identify and classify metals by appearance, weight, spark testing and magnetic properties.

02.0 READ BLUEPRINTS--The student will be able to:

02.01 Interpret detail drawings.
02.02 List materials for fabrication from blueprint.
02.03 Develop shop drawings.

03.0 IDENTIFY METALS--The student will be able to:

03.01 Identify metals by appearance and weight.
03.02 Identify materials by spark test.
03.03 Classify metals by magnetic properties.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Basic Welding
PROGRAM NUMBER: 8754200
COURSE TITLE: Basic Welding 3
COURSE NUMBER: 8754230

COURSE DESCRIPTION:

This course is designed to provide instruction in the safe set up and use of oxy-fuel equipment to cut carbon steel, run beads and weld carbon steel joints.

04.0 APPLY GAS WELDING SKILLS--The student will be able to:

04.01 Set up oxy-fuel equipment.
04.02 Cut carbon steel using oxy-fuel equipment.
04.03 Run beads with gas welding equipment.
04.04 Gas weld carbon steel joints.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Basic Welding
PROGRAM NUMBER: 8754200

COURSE TITLE: Basic Welding 4
COURSE NUMBER: 8754240

COURSE DESCRIPTION:

This course is designed to provide instruction in the use of shielded metal arc welding equipment, surfacing skills, welding single and multiple pass lap joints, welding of outside corners, and multiple pass "tee" joints in all positions.

05.0 APPLY SHIELDED METAL ARC WELDING SKILLS (SMAW)--The student will be able to:

05.01 Run beads with SMAW equipment.
05.02 Apply surfacing skills.
05.03 Weld single pass and multiple pass lap joints.
05.04 Weld outside corner joints.
05.05 Weld multiple pass "tee" joints in all positions.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Basic Welding
PROGRAM NUMBER: 8754200

COURSE TITLE: Basic Welding 5
COURSE NUMBER: 8754250

COURSE DESCRIPTION:

This course is designed to provide instruction in the safe set up and use of GTAW (TIG) equipment for running beads, welding aluminum, mild steel and stainless steel joints, safely use GMAW (MIG) equipment to run beads and weld mild steel joints.

06.0 APPLY SHIELDED GAS ARC WELDING SKILLS (GTAW), (GMAW), AND (FCAW)--The student will be able to:

06.01 Assemble GTAW equipment (TIG).
06.02 Run beads with GTAW equipment.
06.03 Weld aluminum joints with GTAW equipment.
06.04 Weld mild steel joints with GTAW equipment.
06.05 Weld stainless steel joints with GTAW equipment.
06.06 Run beads with GMAW equipment (MIG).
06.07 Weld mild steel joints with GMAW equipment.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Basic Welding
PROGRAM NUMBER: 8754200

COURSE TITLE: Basic Welding 6
COURSE NUMBER: 8754260

COURSE DESCRIPTION:

This course is designed to provide instruction in the practical application of the various welding skills and practices developed in the previous five courses and employability skills.

01.0 APPLY BASIC SHOP SKILLS--The student will be able to:

01.02 Apply safety practices.
01.03 Apply measuring skills.
01.04 Apply cutting skills.
01.05 Apply bending skills.
01.06 Apply drilling skills.
01.08 Apply finishing skills.

02.0 READ BLUEPRINTS--The student will be able to:

02.01 Interpret detail drawings.
02.02 List materials for fabrication from blueprint.
02.03 Develop shop drawings.

04.0 APPLY GAS WELDING SKILLS--The student will be able to:

04.01 Set up oxy-fuel equipment.
04.02 Cut carbon steel using oxy-fuel equipment.
04.03 Run beads with gas welding equipment.
04.04 Gas weld carbon steel joints.

05.0 APPLY SHIELDED METAL ARC WELDING SKILLS (SMAW)--The student will be able to:

05.01 Run beads with SMAW equipment.
05.02 Apply surfacing skills.
05.03 Weld single pass and multiple pass lap joints.
05.04 Weld outside corner joints.
05.05 Weld multiple pass "tee" joints in all positions.

06.0 APPLY SHIELDED GAS ARC WELDING SKILLS (GTAW), (GMAW), AND (FCAW)--The student will be able to:

06.01 Assemble GTAW equipment (TIG).
06.02 Run beads with GTAW equipment.
06.03 Weld aluminum joints with GTAW equipment.
06.04 Weld mild steel joints with GTAW equipment.
06.05 Weld stainless steel joints with GTAW equipment.
06.06 Run beads with GMAW equipment (MIG).
06.07 Weld mild steel joints with GMAW equipment.

07.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

07.01 Conduct a job search.
07.02 Secure information about a job.
07.03 Identify documents which may be required when applying for a job interview.
07.04 Complete a job application form correctly.
07.05 Demonstrate competence in job interview techniques.
07.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
07.07 Identify acceptable work habits.
07.08 Demonstrate knowledge of how to make job changes appropriately.
07.09 Demonstrate acceptable employee health habits.

08.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

08.01 Define entrepreneurship.
08.02 Describe the importance of entrepreneurship to the American economy.
08.03 List the advantages and disadvantages of business ownership.
08.04 Identify the risks involved in ownership of a business.
08.05 Identify the necessary personal characteristics of a successful entrepreneur.
08.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial
FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987
PROGRAM TITLE: Biomedical Equipment Technology
CODE NUMBER: Secondary _____ Postsecondary EST0410
Florida CIP IN15.040100

SECONDARY SCHOOL CREDITS _____ COLLEGE CREDITS _____ POSTSECONDARY ADULT VOCATIONAL CREDITS _____

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational
_____ Postsecondary Vocational x Other 13-15

CERTIFICATION COVERAGE: TECH MED @ 5 BIOMED EQ 7 PRAC NURSE 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as electromedical equipment repairers (729.281-030), biomedical equipment technicians (019.261-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, basic electronics, hydraulics, pneumatics, optics and mechanics to troubleshoot, service and repair equipment commonly used for treatment, diagnosis and monitoring patients in a medical environment.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in electronic, hydraulic, pneumatic and optical systems commonly found in treatment, diagnostic, and monitoring devices.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 2160 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in DC electronics through problem-solving, use of circuit diagrams and schematics, identification and application of components, use of appropriate tools and test equipment, and basic troubleshooting procedures.
02. Demonstrate proficiency in AC electronics through problem-solving, use of circuit diagrams and schematics, identification and application of components, use of appropriate tools and test equipment, and basic troubleshooting procedures.
03. Demonstrate proficiency in semiconductor devices through problem-solving, use of circuit diagrams and schematics, identification and application of components, use of appropriate tools and test equipment, and basic troubleshooting procedures.

04. Demonstrate proficiency in electronic circuits through problem-solving, use of circuit diagrams and schematics, identification and application of components, use of appropriate tools and test equipment, and basic troubleshooting procedures.
05. Demonstrate proficient soldering and chassis assembly technique.
06. Demonstrate proficiency in digital circuits and devices through problem-solving, use of circuit diagrams and schematics, identification and application of components, use of appropriate tools and test equipment, and basic troubleshooting procedures.
07. Demonstrate proficiency in microprocessors through problem-solving, use of circuit diagrams and schematics, identification and application of components, use of appropriate tools and test equipment, and basic troubleshooting procedures.
08. Demonstrate proficiency in troubleshooting and repairing mechanical systems.
09. Troubleshoot, service, align, and repair feedback systems.
10. Troubleshoot, service and repair hydraulic and pneumatic systems.
11. Troubleshoot, service and repair optical systems.
12. Troubleshoot, service and repair treatment devices.
13. Troubleshoot, service and repair diagnostic devices.
14. Troubleshoot, service and repair monitoring devices.
15. Operate testers and analyzers.
16. Recognize and respond to electrical device hazards.
17. Prepare and interpret technical records and reports.
18. Demonstrate employability skills.
19. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial SECONDARY NUMBER: ________

PROGRAM TITLE: Biomedical Equipment Technology POSTSECONDARY NUMBER: EST0410

01.0 DEMONSTRATE PROFICIENCY IN DC ELECTRONICS THROUGH PROBLEM-SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS, USE OF APPROPRIATE TOOLS AND TEST EQUIPMENT, AND BASIC TROUBLESHOOTING PROCEDURES--The student will be able to:

01.01 Solve basic algebraic problems as applicable to electronics.
01.02 Relate electricity to nature of matter.
01.03 Identify sources of electricity.
01.04 Define voltage, current, resistance, power, and energy.
01.05 Apply and relate OHMS law.
01.06 Read and interpret color codes to identify resistors.
01.07 Measure properties of a circuit using VOM and DVM meters.
01.08 Compute and measure conductance and resistance of conductors and insulators.
01.09 Analyze series circuits.
01.10 Construct series circuits.
01.11 Troubleshoot series circuits.
01.12 Analyze parallel circuits.
01.13 Construct parallel circuits.
01.14 Troubleshoot parallel circuits.
01.15 Analyze series-parallel circuits.
01.16 Construct series-parallel circuits.
01.17 Troubleshoot series-parallel circuits.
01.18 Analyze voltage dividers (loaded and unloaded).
01.19 Construct voltage dividers (loaded and unloaded).
01.20 Troubleshoot voltage dividers (loaded and unloaded).
01.21 Solve network theorem problems using Kirch-hof, (V&I), Thevenin, Norton, Superposition, and Delta-wye.
01.22 Analyze maximum power transfer theory.
01.23 Construct maximum power transfer theory.
01.24 Troubleshoot maximum power transfer theory.
01.25 Define magnetic properties of circuits and devices.
01.26 Determine physical and electrical characteristics of capacitors and inductors.
01.27 Analyze and measure RL and RC time constants.
01.28 Set up and operate VOM for DC circuits.
01.29 Set up and operate DVM for DC circuits.
01.30 Set up and operate power supplies for DC circuits.
01.31 Set up and operate oscilloscopes for DC circuits.

02.0 DEMONSTRATE PROFICIENCY IN AC ELECTRONICS THROUGH PROBLEM-SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS, USE OF APPROPRIATE TOOLS AND TEST EQUIPMENT, AND BASIC TROUBLESHOOTING PROCEDURES--The student will be able to:

02.01 Solve basic trigonometric problems as applicable to electronics.
02.02 Identify properties of an AC signal.
02.03 Identify AC sources.
02.04 Analyze and measure AC signals using oscilloscope frequency meters and generators.
02.05 Analyze AC capacitive circuits.
02.06 Construct AC capacitive circuits.
02.07 Troubleshoot AC capacitive circuits.
02.08 Analyze AC inductive circuits.
02.09 Construct AC inductive circuits.
02.10 Troubleshoot AC inductive circuits.
02.11 Analyze and apply principles of transformers to AC circuits.
02.12 Analyze RLC circuits (series, parallel, complex).
02.13 Construct RLC circuits (series, parallel, complex).
02.14 Troubleshoot RLC circuits (series, parallel, complex).
02.15 Analyze series and parallel resonant circuits.
02.16 Construct series and parallel resonant circuits.
02.17 Troubleshoot series and parallel resonant circuits.
02.18 Analyze filter circuits.
02.19 Construct filter circuits.
02.20 Troubleshoot filter circuits.
02.21 Analyze polyphase circuits.
02.22 Construct polyphase circuits.
02.23 Troubleshoot polyphase circuits.
02.24 Analyze basic motor theory and operation.

02.25 Analyze basic generator theory and operation.
02.26 Set up and operate VOM for AC circuits.
02.27 Set up and operate DVM for AC circuits.
02.28 Set up and operate power supplies for AC circuits.
02.29 Set up and operate oscilloscopes for AC circuits.
02.30 Set up and operate frequency counters for AC circuits.
02.31 Set up and operate signal operators for AC circuits.
02.32 Set up and operate capacitor-inductor analyzers for AC circuits.
02.33 Set up and operate impedance bridges for AC circuits.

03.0 DEMONSTRATE PROFICIENCY IN SEMICONDUCTOR DEVICES THROUGH PROBLEM-SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS, USE OF APPROPRIATE TOOLS AND TEST EQUIPMENT, AND BASIC TROUBLESHOOTING PROCEDURES--The student will be able to:

03.01 Identify properties of semiconductor materials.
03.02 Analyze and measure characteristics of P-N junction diodes.
03.03 Analyze and measure characteristics of special diodes.
03.04 Analyze diode circuits.
03.05 Construct diode circuits.
03.06 Troubleshoot diode circuits.
03.07 Identify, define and measure characteristics of bipolar transistors.
03.08 Identify, define, and measure FET characteristics.
03.09 Identify, define, and measure characteristics of thyristors.
03.10 Identify types and characteristics of integrated circuits.
03.11 Set up and operate VOM for solid state devices.
03.12 Set up and operate DVM for solid state devices.
03.13 Set up and operate power supplies for solid state devices.
03.14 Set up and operate oscilloscopes for solid state devices.
03.15 Set up and operate frequency counters for solid state devices.
03.16 Set up and operate signal generators for solid state devices.
03.17 Set up and operate capacitor-inductor analyzers for solid state devices.
03.18 Set up and operate impedance bridges for solid state devices.
03.19 Set up and operate curve tracers.
03.20 Set up and operate transistor testers.
03.21 Identify types and characteristics of hybrid microcircuits.

04.0 DEMONSTRATE PROFICIENCY IN ELECTRONIC CIRCUITS THROUGH PROBLEM-SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS, USE OF APPROPRIATE TOOLS AND TEST EQUIPMENT, AND BASIC TROUBLESHOOTING PROCEDURES--The student will be able to:

04.01 Analyze single-state amplifiers.
04.02 Construct single-stage amplifiers.
04.03 Troubleshoot single-stage amplifiers.
04.04 Analyze multi-stage amplifiers.
04.05 Construct multi-stage amplifiers.
04.06 Troubleshoot multi-stage amplifiers.
04.07 Analyze basic power supplies and filters.
04.08 Construct basic power supplies and filters.
04.09 Troubleshoot basic power supplies and filters.
04.10 Analyze differential and operational amplifiers.
04.11 Construct differential and operational amplifiers.
04.12 Troubleshoot differential and operational amplifiers.
04.13 Analyze power supply regulators.
04.14 Construct power supply regulators.
04.15 Troubleshoot power supply regulators.
04.16 Analyze active filters.
04.17 Construct active filters.
04.18 Troubleshoot active filters.
04.19 Analyze oscillators.
04.20 Construct oscillators.
04.21 Troubleshoot oscillators.
04.22 Analyze motor or phase control circuits.
04.23 Set up and operate VOM for analog circuits.
04.24 Set up and operate DVM for analog circuits.
04.25 Set up and operate power supplies for analog circuits.
04.26 Set up and operate oscilloscopes for analog circuits.
04.27 Set up and operate frequency counters for analog circuits.
04.28 Set up and operate signal generators for analog circuits.
04.29 Set up and operate capacitor-inductor analyzers for analog circuits.

04.30 Set up and operate impedance bridges for analog circuits.

05.0 DEMONSTRATE PROFICIENT SOLDERING AND CHASSIS ASSEMBLY TECHNIQUES--The student will be able to:

05.01 Select, maintain and use soldering and desoldering tools.
05.02 Use solders with different tin/lead percentages.
05.03 Solder conductors and components to: turret, cup, bifurcated, hooked, pierced terminals and connectors.
05.04 Solder axial lead components to printed circuit (PC) boards.
05.05 Remove components and conductors from terminals without damage, including IC's, TO-5, transistors, diodes, transformers and controls.
05.06 Repair damaged PC board circuitry.

06.0 DEMONSTRATE PROFICIENCY IN DIGITAL CIRCUITS AND DEVICES THROUGH PROBLEM-SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS, USE OF APPROPRIATE TOOLS AND TEST EQUIPMENT, AND BASIC TROUBLESHOOTING PROCEDURES--The student will be able to:

06.01 Define and apply number systems to codes and arithmetic.
06.02 Analyze logic gates.
06.03 Construct logic gates.
06.04 Troubleshoot logic gates.
06.05 Analyze flip-flops.
06.06 Construct flip-flops.
06.07 Troubleshoot flip-flops.
06.08 Identify, define, and measure characteristics of IC logic families.
06.09 Analyze registers and counters.
06.10 Construct registers and counters.
06.11 Troubleshoot registers and counters.
06.12 Analyze clock and timing circuits.
06.13 Construct clock and timing circuits.
06.14 Troubleshoot clock and timing circuits.
06.15 Analyze logic arithmetic circuits.
06.16 Construct logic arithmetic circuits.
06.17 Troubleshoot logic arithmetic circuits.
06.18 Analyze encoders and decoders.
06.19 Construct encoders and decoders.
06.20 Troubleshoot encoders and decoders.
06.21 Analyze multiplexers and demultiplexers.
06.22 Construct multiplexers and demultiplexers.
06.23 Troubleshoot multiplexers and demultiplexers.
06.24 Analyze memory devices.
06.25 Construct memory devices.
06.26 Troubleshoot memory devices.
06.27 Analyze digital to analog and analog to digital.
06.28 Construct digital to analog and analog to digital.
06.29 Troubleshoot digital to analog and analog to digital.
06.30 Analyze displays.
06.31 Construct displays.
06.32 Troubleshoot displays.
06.33 Analyze/minimize logic circuits using boolean operations.
06.34 Analyze representative digital systems.
06.35 Construct representative digital systems.
06.36 Troubleshoot representative digital systems.
06.37 Set up and operate VOM for digital devices.
06.38 Set up and operate DVM for digital devices.
06.39 Set up and operate logic probes for digital devices.
06.40 Set up and operate power supplies for digital devices.
06.41 Set up and operate pulsers for digital devices.
06.42 Set up and operate oscilloscopes for digital devices.
06.43 Set up and operate logic analyzers for digital devices.
06.44 Set up and operate signature analyzers for digital devices.
06.45 Set up and operate pulse generators for digital devices.
06.46 Set up and operate counters for digital devices.

07.0 DEMONSTRATE PROFICIENCY IN MICROPROCESSORS THROUGH PROBLEM-SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS, USE OF APPROPRIATE TOOLS AND TEST EQUIPMENT, AND BASIC TROUBLESHOOTING PROCEDURES--The student will be able to:

07.01 Analyze CPU's.

07.02 Construct CPU's.
07.03 Troubleshoot CPU's.
07.04 Construct BUS systems.
07.05 Construct BUS systems.
07.06 Troubleshoot BUS systems.
07.07 Analyze memory systems.
07.08 Construct memory systems.
07.09 Troubleshoot memory systems.
07.10 Analyze input/output ports.
07.11 Construct input/output ports.
07.12 Troubleshoot input/output ports.
07.13 Executive computer instruction sets.
07.14 Analyze and troubleshoot microcomputer systems.
07.15 Analyze microprocessor applications and systems.
07.16 Construct microprocessor applications and systems.
07.17 Troubleshoot microprocessor applications and systems.
07.18 Set up and operate VOM for microprocessing.
07.19 Set up and operate DVM for microprocessing.
07.20 Set up and operate logic probes for microprocessing.
07.21 Set up and operate power supplies for microprocessing.
07.22 Set up and operate pulsers for microprocessing.
07.23 Set up and operate oscilloscopes for microprocessing.
07.24 Set up and operate logic/data analyzers for microprocessing.
07.25 Set up and operate signature analyzers for microprocessing.
07.26 Set up and operate pulse generators for microprocessing.
07.27 Set up and operate counters for microprocessing.

08.0 DEMONSTRATE PROFICIENCY IN TROUBLESHOOTING AND REPAIRING MECHANICAL SYSTEMS--The student will be able to:

08.01 Analyze power transmission components (gears, belts, chains, couplings, clutches, screw systems).
08.02 Troubleshoot power transmission components.
08.03 Repair power transmission components.
08.04 Align power transmission components.
08.05 Analyze bearings.
08.06 Troubleshoot bearings.
08.07 Repair bearings.
08.08 Apply lubrication specifications to mechanical systems.
08.09 Analyze linkages and levers.
08.10 Troubleshoot linkages and levers.
08.11 Repair linkages and levers.
08.12 Align linkages and levers.
08.13 Analyze cams.
08.14 Troubleshoot cams.
08.15 Repair cams.
08.16 Align cams.
08.17 Analyze materials to statics and material specifications.
08.18 Troubleshoot materials to statics and material specifications.
08.19 Repair materials to statics and material specifications.
08.20 Analyze metals to heat treating specifications.
08.21 Troubleshoot metals to heat treating specifications.
08.22 Repair metals to heat treating specifications.

09.0 TROUBLESHOOT, SERVICE, ALIGN, AND REPAIR FEEDBACK SYSTEMS--The student will be able to:

09.01 Analyze transducers.
09.02 Troubleshoot transducers.
09.03 Align transducers.
09.04 Analyze motor controls.
09.05 Troubleshoot motor controls.
09.06 Repair motor controls.
09.07 Align motor controls.
09.08 Analyze synchros and resolvers.
09.09 Troubleshoot synchros and resolvers.
09.10 Align synchros and resolvers.
09.11 Analyze pulse encoders.
09.12 Troubleshoot pulse encoders.
09.13 Align pulse encoders.
09.14 Analyze farrand scales.
09.15 Troubleshoot farrand scales.
09.16 Align farrand scales.

10.0 TROUBLESHOOT, SERVICE AND REPAIR HYDRAULIC AND PNEUMATIC SYSTEMS--The student will be able to:

10.01 Clean components and systems.
10.02 Analyze pumps (positive and negative pressures).
10.03 Troubleshoot pumps (positive and negative pressures).
10.04 Align pumps (positive and negative pressures).
10.05 Analyze control and metering devices.
10.06 Troubleshoot control and metering devices.
10.07 Repair control and metering devices.
10.08 Analyze electromechanical valves (directional and control).
10.09 Troubleshoot electromechanical valves (directional and control).
10.10 Repair electromechanical valves (directional and control).
10.11 Analyze valve actuators (solenoid, servo, flow-control).
10.12 Troubleshoot valve actuators (solenoid, servo, flow-control).
10.13 Repair valve actuators (solenoid, servo, flow-control).
10.14 Analyze linear and rotary actuators.
10.15 Troubleshoot linear and rotary actuators.
10.16 Repair linear and rotary actuators.
10.17 Analyze pressure and flow regulators.
10.18 Troubleshoot pressure and flow regulators.
10.19 Repair pressure and flow regulators.
10.20 Analyze hydraulic and pneumatic circuits and systems.
10.21 Troubleshoot hydraulic and pneumatic circuits and systems.
10.22 Repair hydraulic and pneumatic circuits and systems.
10.23 Analyze piping reservoirs and fittings.
10.24 Troubleshoot piping reservoirs and fittings.
10.25 Repair piping reservoirs and fittings.

11.0 TROUBLESHOOT, SERVICE AND REPAIR OPTICAL SYSTEMS--The student will be able to:

11.01 Analyze optics systems.
11.02 Troubleshoot optics systems.
11.03 Repair optics systems.
11.04 Analyze laser detectors.
11.05 Troubleshoot laser detectors.
11.06 Repair laser detectors.
11.07 Set up and operate laser alignment equipment.
11.08 Set up and operate laser interferometers.

12.0 TROUBLESHOOT, SERVICE AND REPAIR TREATMENT DEVICES--The student will be able to:

12.01 Determine operational status of surgical lasers.
12.02 Troubleshoot surgical lasers.
12.03 Remove and replace surgical lasers components.
12.04 Perform operating systems check and make minor adjustments of surgical lasers.
12.05 Determine operational status of dialysis machines.
12.06 Troubleshoot dialysis machines.
12.07 Remove and replace dialysis machines components.
12.08 Perform operating systems check and make minor adjustments of dialysis machines.
12.09 Determine operational status of diathermy machines.
12.10 Troubleshoot diathermy machines.
12.11 Remove and replace diathermy machines components.
12.12 Perform operating systems check and make minor adjustments of diathermy machines.
12.13 Determine operational status of anesthesialogic devices.
12.14 Troubleshoot anesthesialogic devices.
12.15 Remove and replace anesthesialogic devices components.
12.16 Perform operating systems check and make minor adjustments of anesthesialogic devices.
12.17 Determine operational status of infusion control devices.
12.18 Troubleshoot infusion control devices.
12.19 Remove and replace infusion control devices components.
12.20 Perform operational systems check and make minor adjustments of infusion control devices.
12.21 Determine operational status of pacemaker support equipment.
12.22 Troubleshoot pacemaker support equipment.
12.23 Remove and replace pacemaker support equipment components.
12.24 Perform operating systems check and make minor adjustments of pacemaker support equipment.

12.25 Determine operational status of respiration therapy devices.
12.26 Troubleshoot respiration therapy devices.
12.27 Remove and replace respiration therapy device components.
12.28 Perform operating systems check and make minor adjustments of respiratory therapy devices.
12.29 Determine operational status of surgical microscopes.
12.30 Troubleshoot surgical microscopes.
12.31 Remove and replace surgical microscope components.
12.32 Perform operating systems check and make minor adjustments of surgical microscopes.
12.33 Determine operational status of sterilizers (gas and EtO).
12.34 Troubleshoot sterilizer (gas & EtO) devices.
12.35 Remove and replace sterilizer (gas and EtO) components.
12.36 Perform operating systems check and make minor adjustments of gas and EtO sterilizers.
12.37 Determine operating status of defibrillators.
12.38 Troubleshoot defibrillators.
12.39 Remove and replace defibrillator components.
12.40 Perform operating systems check and make minor adjustments of defibrillator devices.
12.41 Determine operational status of electrosurgical devices.
12.42 Troubleshoot electrosurgical devices.
12.43 Remove and replace electrosurgical device components.
12.44 Perform operation systems check and make minor adjustments of electrosurgical devices.
12.45 Determine operational status of portable X-ray machines (simple).
12.46 Troubleshoot portable X-ray machines (simple).
12.47 Remove and replace portable X-ray machines (simple) components.
12.48 Perform operation systems check and make minor adjustments of portable X-ray machines (simple).
12.49 Determine operational status of electrical bed stations.
12.50 Troubleshoot electrical bed stations.
12.51 Remove and replace electrical bed station components.
12.52 Perform operating systems check and make minor adjustments of electrical bed station.
12.53 Determine operational status of hyperthermia and hypothermia devices.
12.54 Troubleshoot hyperthermia and hypothermia devices.
12.55 Remove and replace hyperthermia and hypothermia devices components.
12.56 Perform operation systems check and make minor adjustments of hyper/hypothermia devices.
12.57 Determine operational status of radiant warmers.
12.58 Troubleshoot radiant warmers.
12.59 Remove and replace radiant warmer components.
12.60 Perform operating systems check and make minor adjustment of radiant warmers.
12.61 Determine operational status of incubators.
12.62 Troubleshoot incubators.
12.63 Remove and replace incubator components.
12.64 Perform operating systems check and make minor adjustments of incubators.
12.65 Determine operational status of fetal monitors.
12.66 Troubleshoot fetal monitors.
12.67 Remove and replace fetal monitor components.
12.68 Perform operating systems check and make minor adjustments of fetal monitors.
12.69 Determine operational status of chun guns.
12.70 Troubleshoot chun guns.
12.71 Remove and replace chun gun components.
12.72 Perform operating systems check and make minor adjustments of chun guns.

13.0 TROUBLESHOOT, SERVICE AND REPAIR DIAGNOSTIC DEVICES--The student will be able to:

13.01 Determine the operating status of blood cell counters.
13.02 Troubleshoot blood cell counters.
13.03 Remove and replace blood cell counter components.
13.04 Perform operating systems check and make minor adjustments of blood cell counters.
13.05 Determine the operating status of centrifuge devices.
13.06 Troubleshoot centrifuge devices.
13.07 Remove and replace centrifuge device components.

13.08 Perform operating systems check and make minor adjustments of centrifuge devices.
13.09 Determine the operating status of nepholometry devices.
13.10 Troubleshoot nepholometry devices.
13.11 Remove and replace nepholometry device components.
13.12 Perform operating systems check and make minor adjustments of Nepholometry devices.
13.13 Determine the operational status of automated chemistry analyzers.
13.14 Troubleshoot automated chemistry analyzers.
13.15 Remove and replace automated chemistry analyzer components.
13.16 Perform operation systems check and make minor adjustments of automated chemistry analyzers.
13.17 Determine the operational status of simple scintillation counters.
13.18 Troubleshoot simple scintillation counters.
13.19 Remove and replace scintillation counter components.
13.20 Perform operation systems check and make minor adjustments of simple scintillation counters.
13.21 Determine the operations status of audiometers.
13.22 Troubleshoot audiometers.
13.23 Remove and replace audiometer components.
13.24 Perform operation systems check and make minor adjustments of audiometers.
13.25 Determine the operational status of electrophoresis equipment.
13.26 Troubleshoot electrophoresis equipment.
13.27 Remove and replace electrophoresis equipment components.
13.28 Perform operating systems check and make minor adjustments of electrophoresis equipment.
13.29 Determine the operational status of blood gas analyzers.
13.30 Troubleshoot blood gas analyzers.
13.31 Remove and replace blood gas analyzer components.
13.32 Perform operating systems check and make minor adjustments of blood gas analyzers.
13.33 Determine the operational status of HPLC and gas chromatograph equipment.
13.34 Troubleshoot HPLC and gas chromatograph equipment.
13.35 Remove and replace HPLC and gas chromatograph equipment components.
13.36 Perform operating systems check and make minor adjustments of HPLC and gas chromatograph equipment.
13.37 Determine the operational status of refractometers.
13.38 Troubleshoot simple refractometers.
13.39 Remove and replace simple refractometers.
13.40 Perform operating systems check and make minor adjustments of refractometers.
13.41 Determine the operational status of spectrophotometers.
13.42 Troubleshoot spectrophotometers.
13.43 Remove and replace spectrophotometer components.
13.44 Perform operating systems check and make minor adjustments of spectrophotometers.
13.45 Determine the operational status of laboratory microscopes.
13.46 Troubleshoot laboratory microscopes.
13.47 Remove and replace laboratory microscope components.
13.48 Perform operating systems check and make minor adjustments of laboratory microscopes.
13.49 Determine operational status of EEG devices.
13.50 Troubleshoot EEG devices.
13.51 Remove and replace EEG device components.
13.52 Perform operating systems check and make minor adjustments of EEG devices.
13.53 Determine operational status of EMG devices.
13.54 Troubleshoot EMG devices.
13.55 Remove and replace EMG device components.
13.56 Perform operating systems check and make minor adjustments of EMG devices.
13.57 Determine operational status of ENG devices.
13.58 Troubleshoot ENG devices.
13.59 Remove and replace ENG device components.
13.60 Perform operating systems check and make minor adjustments of ENG devices.
13.61 Determine operational status of transcutaneous devices.
13.62 Troubleshoot transcutaneous devices.
13.63 Remove and replace transcutaneous device components.
13.64 Perform operating systems check and make minor adjustments of transcutaneous devices.

14.0 TROUBLESHOOT, SERVICE AND REPAIR MONITORING DEVICES--The student will be able to:

14.01 Determine the operational status of EKG devices.
14.02 Troubleshoot EKG devices.
14.03 Remove and replace EKG device and components.
14.04 Perform operating systems check and make minor adjustments of EKG devices.
14.05 Determine the operational status of pressure devices.
14.06 Troubleshoot pressure devices.
14.07 Remove and replace pressure device components.
14.08 Perform operating systems check and make minor adjustments of pressure devices.
14.09 Determine the operation status of temperature devices.
14.10 Troubleshoot temperature devices.
14.11 Remove and replace temperature device components.
14.12 Perform operating systems check and make minor adjustments of temperature devices.
14.13 Determine the operational status of respiration devices.
14.14 Troubleshoot respiration devices.
14.15 Remove and replace respiration device components.
14.16 Perform operating systems check and make minor adjustments of respiration devices.
14.17 Determine the operational status of fluid output devices.
14.18 Troubleshoot fluid output devices.
14.19 Remove and replace fluid output device components.
14.20 Perform operating systems check and make minor adjustments of fluid output devices.
14.21 Determine the operational status of holter monitors.
14.22 Troubleshoot holter monitors.
14.23 Remove and replace holter monitors device components.
14.24 Perform operating systems check and make minor adjustments of holter monitors.
14.25 Determine the operational status of telemetry systems.
14.26 Troubleshoot telemetry systems.
14.27 Remove and replace telemetry system components.
14.28 Perform operating systems check and make minor adjustments of telemetry systems.
14.29 Determine the operational status of doppler blood flow devices.
14.30 Troubleshoot doppler blood flow devices.
14.31 Remove and replace doppler blood flow device components.
14.32 Perform operating systems check and make minor adjustments of doppler blood flow devices.
14.33 Determine the operational status of in vivo pressure transducers.
14.34 Troubleshoot in vivo pressure transducers.
14.35 Remove and replace in vivo pressure transducer components.
14.36 Perform operating systems check and make minor adjustments of in vivo pressure transducers.
14.37 Determine the operational status of chart recorders.
14.38 Troubleshoot chart recorders.
14.39 Remove and replace chart recorder components.
14.40 Perform operating systems check and make minor adjustments.

15.0 OPERATE TESTERS AND ANALYZERS--The student will be able to:

15.01 Operate safety analyzer.
15.02 Operate defibrillator tester.
15.03 Operate electrosurgical analyzer.
15.04 Operate EKG simulator.
15.05 Operate pressure simulator.
15.06 Operate temperature simulator.

16.0 RECOGNIZE AND RESPOND TO ELECTRICAL DEVICE HAZARDS--The student will be able to:

16.01 Perform safety checks on electrical devices.
16.02 Maintain leakage records on electrical devices.
16.03 Recognize and correctly respond to radiation hazards.
16.04 Perform safety checks on radiation devices.
16.05 Recognize and correctly respond to biological hazards.
16.06 Recognize and correctly respond to chemical hazards.
16.07 Recognize and correctly respond to mechanical hazards.
16.08 Perform safety checks on mechanical devices.
16.09 Recognize and correctly respond to fluidic device hazards.

17.0 PREPARE AND INTERPRET TECHNICAL RECORDS AND REPORTS--The student will be able to:

17.01 Apply proper safety standards.
17.02 Make electrical connections.
17.03 Identify and use hand tools properly.
17.04 Identify and use power tools properly.
17.05 Handle static sensitive devices.
17.06 Identify and use fasteners (screws, washers, pins, connectors).
17.07 Solder using proper soldering techniques.
17.08 Set up and operate scales.
17.09 Set up and operate micrometers.
17.10 Set up and operate rules.
17.11 Set up and operate drill blocks.
17.12 Set up and operate dial indicators.
17.13 Set up and operate vernier scales.
17.14 Set up and operate mechanical and optical measuring devices.
17.15 Set up and operate height gauges.
17.16 Set up and operate depth gauges.
17.17 Read and convert measurements.
17.18 Perform preventive maintenance according to vendor specifications.
17.19 Develop and implement preventive maintenance schedules.
17.20 Use soldering equipment.
17.21 Practice safe and efficient work habits.
17.22 Diagnose malfunctions applying logical troubleshooting techniques.
17.23 Prepare and use service records/documentation.
17.24 Read and interpret diagrams and schematics.
17.25 Read and interpret manufacturers' specifications and operating manuals.
17.26 Read and interpret current industry standards, practices, and techniques.
17.27 Draw and interpret electrical electronic and mechanical schematics.
17.28 Record data and design curves and graphs.
17.29 Write reports.
17.30 Maintain test logs.
17.31 Make equipment failure reports.
17.32 Specify and requisition simple electronic components.
17.33 Compose technical letters.
17.34 Write formal reports of laboratory experiences.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct a job search.
18.02 Secure information about a job.
18.03 Identify documents which may be required when applying for a job interview.
18.04 Complete a job application form correctly.
18.05 Demonstrate competence in job interview techniques.
18.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
18.07 Identify acceptable work habits.
18.08 Demonstrate knowledge of how to make job changes appropriately.
18.09 Demonstrate acceptable employee health habits.

19.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

19.01 Define entrepreneurship.
19.02 Describe the importance of entrepreneurship to the American economy.
19.03 List the advantages and disadvantages of business ownership.
19.04 Identify the risks involved in ownership of a business.
19.05 Identify the necessary personal characteristics of a successful entrepreneur.
19.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Blueprint Reading and Estimation

CODE NUMBER: Secondary ______ Postsecondary ETD0010

Florida CIP IN46.999901

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-17

CERTIFICATION COVERAGE: TEC CONSTR @7 DRAFTING 7 BLU PR RDG 7
CARPENTRY 7 BLDG CONST @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program/course is to provide supplemental training for persons currently employed.

II. LABORATORY ACTIVITIES: Laboratory activities are offered as on campus or "in-plant" programs in business and company premises.

III. SPECIAL NOTE: The length of this program/course varies with the needs of individual students. It is only offered as a supplemental course or as a component of a specialized program.

If this program is offered for 450 hours or more, in accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level corresponds with the grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 150 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Maintain blueprints.
02. Prepare sketches.
03. Develop basic blueprint reading skills.
04. Interpret mechanical drawings.
05. Interpret architectural drawings.
06. Interpret structural drawings.
07. Interpret electronic drawings.
08. Interpret pneumatic/hydraulic drawings.
09. Interpret charts and graphs.
10. Interpret maps drawings.
11. Estimate materials and cost.
12. Identify codes and standards.
13. Demonstrate employability skills.
14. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ____________

PROGRAM TITLE: Blueprint Reading and Estimation POSTSECONDARY NUMBER: ETD0010

01.0 MAINTAIN BLUEPRINTS--The student will be able to:

01.01 Make a blueprint.
01.02 Maintain blueprints.

02.0 PREPARE SKETCHES--The student will be able to:

02.01 Use freehand techniques.
02.02 Prepare multi-view sketch drawings.
02.03 Prepare pictorial sketch drawings.

03.0 DEVELOP BASIC BLUEPRINT READING SKILLS--The student will be able to:

03.01 Apply math skills.
03.02 Read scales and measuring instruments.
03.03 Read and interpret multi-view drawings.
03.04 Read and interpret section views.
03.05 Read and interpret auxiliary views.
03.06 Read and interpret types of dimensions.
03.07 Read and interpret pictorial drawings.
03.08 Read and interpret supplementary information.

04.0 INTERPRET MECHANICAL DRAWINGS--The student will be able to:

04.01 Read and interpret removable fastener drawings.
04.02 Read and interpret welding drawings.
04.03 Read and interpret geometric tolerances.
04.04 Read and interpret cam drawings.
04.05 Read and interpret gear drawings.
04.06 Read and interpret assembly and sub-assembly drawings.
04.07 Read and interpret detail drawings.
04.08 Read and interpret surface developments.
04.09 Read and interpret bearing drawings.
04.10 Read and interpret spring drawings.
04.11 Read and interpret casting drawings.
04.12 Read and interpret forging drawings.
04.13 Read and interpret tool drawings.
04.14 Read and interpret stamping drawings.
04.15 Read and interpret numerical control drawings.
04.16 Read and interpret computer aided drawings.

05.0 INTERPRET ARCHITECTURAL DRAWINGS--The student will be able to:

05.01 Read and interpret plot plans.
05.02 Read and interpret foundation plan drawings.
05.03 Read and interpret floor plan drawings.
05.04 Read and interpret elevation drawings.
05.05 Read and interpret section views and details.
05.06 Read and interpret schedules.
05.07 Read and interpret stair details.
05.08 Read and interpret fireplace details.
05.09 Read and interpret truss drawings.
05.10 Read and interpret roof-framing plans.
05.11 Read and interpret electrical plans.
05.12 Read and interpret plumbing drawings.
05.13 Read and interpret heating/cooling plans.
05.14 Read and interpret landscape layout drawings.
05.15 Read and interpret specifications.

06.0 INTERPRET STRUCTURAL DRAWINGS--The student will be able to:

06.01 Read and interpret erection plans.
06.02 Read and interpret structural steel design drawings.
06.03 Read and interpret structural steel drawings.
06.04 Read and interpret concrete engineering drawings.
06.05 Read and interpret placing drawings.

07.0 INTERPRET ELECTRONIC DRAWINGS--The student will be able to:

07.01 Read and interpret schematic drawings.
07.02 Read and interpret printed circuit board drawings.
07.03 Read and interpret package drawings.
07.04 Read and interpret connection drawings.
07.05 Read and interpret interconnection drawings.
07.06 Read and interpret wiring lists.
07.07 Read and interpret cable drawings.
07.08 Read and interpret harness drawings.
07.09 Read and interpret component drawings.
07.10 Read and interpret logic diagrams.
07.11 Read and interpret block diagrams.

08.0 INTERPRET PNEUMATIC/HYDRAULIC DRAWINGS--The student will be able to:

08.01 Read and interpret pictorial diagrams.
08.02 Read and interpret cutaway diagrams.
08.03 Read and interpret graphical diagrams.
08.04 Read and interpret combination diagrams.

09.0 INTERPRET CHARTS AND GRAPHS--The student will be able to:

09.01 Read and interpret charts.
09.02 Read and interpret graphs.

10.0 INTERPRET MAP DRAWINGS--The student will be able to:

10.01 Read and interpret traverse drawings.
10.02 Read and interpret plat drawings.
10.03 Read and interpret street layout drawings.
10.04 Read and interpret map drawings.
10.05 Read and interpret topographic drawings.

11.0 ESTIMATE MATERIALS AND COSTS--The student will be able to:

11.01 Compile manufactured material take-offs.
11.02 Compile construction take-offs.
11.03 Compile mechanical equipment take-offs.
11.04 Compile electrical/electronic take-offs.
11.05 Compile labor costs.
11.06 Compile equipment costs.
11.07 Compile overhead costs.

12.0 IDENTIFY CODES AND STANDARDS--The student will be able to:

12.01 Identify construction codes and standards.
12.02 Identify mechanical standards.
12.03 Identify electronic standards.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

13.01 Conduct a job search.
13.02 Secure information about a job.
13.03 Identify documents which may be required when applying for a job interview.
13.04 Complete a job application form correctly.
13.05 Demonstrate competence in job interview techniques.
13.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
13.07 Identify acceptable work habits.
13.08 Demonstrate knowledge of how to make job changes appropriately.
13.09 Demonstrate acceptable employee health habits.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship.
14.02 Describe the importance of entrepreneurship to the American economy.
14.03 List the advantages and disadvantages of business ownership.
14.04 Identify the risks involved in ownership of a business.
14.05 Identify the necessary personal characteristics of a successful entrepreneur.
14.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Boatbuilding - Wood and Fabricated

CODE NUMBER: Secondary ______ Postsecondary MTE0995

Florida CIP IN48.079901

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-17

CERTIFICATION COVERAGE: CAB WOODWK 7 CARPENTRY 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as shipfitters (50143400), ship riggers (50144812), boat patchers (61088615), ship wrights (860.381-058), boat builders (860.381-018), boat riggers (806.464-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, fiberglass and marine working skills, mechanical systems, piping systems, electrical systems, and frame and form building. A program may be structured to emphasize either wood or fabricated boatbuilding but does not have to cover both areas comprehensively.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in boat framing, mold building, fiberglass lamination and fabrication, millwork operations, installation of mechanical, electrical and piping systems, plug construction and finishing, painting and wooden boat repair.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1360 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply trade accepted terminology and safety.
02. Perform hand lamination operations.
03. Repair gelcoat.
04. Perform framing operations.
05. Perform trim operations.
06. Perform millwork operations.
07. Install mechanical systems.
08. Install piping systems.
09. Install wiring systems.

10. Perform fiberglass fabrication operations.
11. Perform assembly woodworking operations.
12. Perform plug construction operations.
13. Perform plug finishing operations.
14. Construct molds.
15. Repair fiberglass.
16. Apply paint.
17. Repair wooden boats.
18. Service mechanical systems.
19. Service piping and wiring systems.
20. Demonstrate employability skills.
21. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial SECONDARY NUMBER: ________

PROGRAM TITLE: Boatbuilding - Wood and Fabricated POSTSECONDARY NUMBER: MTE0995

01.0 APPLY TRADE ACCEPTED TERMINOLOGY AND SAFETY--The student will be able to:

01.01 Use curriculum modules.
01.02 Clarify career values.
01.03 Use work schedule and progress chart.
01.04 Use marine and technical terminology.
01.05 Apply shop safety rules.

02.0 PERFORM HAND LAMINATION--The student will be able to:

02.01 Identify tools, materials and precautions.
02.02 Lay up mat laminates.
02.03 Lay up woven laminates.
02.04 Lay up directional laminates.
02.05 Apply reinforced structural bonds.
02.06 Cut and grind laminates to specifications.

03.0 REPAIR GELCOAT--The student will be able to:

03.01 Identify tools, materials and precautions.
03.02 Sand and buff gelcoat.
03.03 Repair gelcoat with putty.
03.04 Repair gelcoat with spray equipment.

04.0 PERFORM FRAMING OPERATIONS--The student will be able to:

04.01 Use frame plans and tools.
04.02 Layout dimensions from plans.
04.03 Fit bulkheads.
04.04 Fit faces and tops.

05.0 PERFORM TRIM OPERATIONS--The student will be able to:

05.01 Identify tools and precautions.
05.02 Identify and apply flat trim moldings.
05.03 Identify and apply cap and corner moldings.
05.04 Hang compartment door.
05.05 Install hull-side paneling.
05.06 Install cabinet doors and drawers.

06.0 PERFORM MILLWORK OPERATIONS--The student will be able to:

06.01 Operate router and shaper.
06.02 Operate table saw and radial arm saw.
06.03 Fabricate cabinetry from plans.
06.04 Apply plastic laminates to cabinetry.
06.05 Operate jointer and surface planer.
06.06 Operate band saw.

07.0 INSTALL MECHANICAL SYSTEMS--The student will be able to:

07.01 Identify tools and precautions.
07.02 Fabricate and install machinery foundations.
07.03 Install engine and shaft line.
07.04 Install mechanical and hydraulic steering.
07.05 Install deck hardware.

08.0 INSTALL PIPING SYSTEMS--The student will be able to:

08.01 Identify tools, materials, and precautions.
08.02 Install through-hull devices.
08.03 Install bilge pump.
08.04 Install tank supports and tank.
08.05 Install hand pump water system.
08.06 Install pressurized water system.
08.07 Install PVC-slip drain system.
08.08 Install engine cooling and exhaust.
08.09 Install fuel systems.

09.0 INSTALL WIRING SYSTEMS--The student will be able to:

09.01 Identify tools, materials, and precautions.
09.02 Install batteries.
09.03 Select DC conductor size.
09.04 Install DC service equipment.
09.05 Install DC lighting and motor circuits.
09.06 Install starting and charging circuits.
09.07 Install bonding and cathodic protection.
09.08 Install AC service equipment.
09.09 Install AC lighting and receptacle circuits.
09.10 Install on-board generator.

10.0 PERFORM FIBERGLASS FABRICATION--The student will be able to:

10.01 Operate chop gun.
10.02 Prepare and apply bonding putty.
10.03 Identify and apply core materials.
10.04 Fabricate parts by vacuum molding.
10.05 Prepare mold for gelcoat.
10.06 Operate gel gun.
10.07 Pull parts.
10.08 Repair molds.
10.09 Maintain molds.

11.0 PERFORM ASSEMBLY WOODWORKING OPERATIONS--The student will be able to:

11.01 Level hull and set up cross-beams.
11.02 Fabricate and install sub-sole components.
11.03 Fabricate and install sale.
11.04 Construct router, shaper, and tracing patterns.
11.05 Cut bulkheads from patterns.
11.06 Construct straight moldings and posts.
11.07 Construct turned corner moldings and posts.
11.08 Construct solid and laminated curved moldings.

12.0 PERFORM PLUG CONSTRUCTION OPERATIONS--The student will be able to:

12.01 Identify components of lines drawings.
12.02 Lay down lines from offsets.
12.03 Pick up body plan.
12.04 Construct patterns and frames.
12.05 Construct, fasten, and fair stringers.
12.06 Apply planking material.

13.0 PERFORM PLUG FINISHING OPERATIONS--The student will be able to:

13.01 Glaze and sheath plug.
13.02 Fill and prime plug.
13.03 Fair plug.
13.04 Prepare and apply finish coat.
13.05 Polish finish coat.

14.0 CONSTRUCT MOLDS--The student will be able to:

14.01 Prepare plug for mold lamination.
14.02 Gel and skin mold.
14.03 Laminate mold.
14.04 Brace and pull mold.
14.05 Prepare mold for first use.

15.0 REPAIR FIBERGLASS--The student will be able to:

15.01 Install point loads and stiffeners.
15.02 Repair laminates.
15.03 Renew bottom paint.

16.0 APPLY PAINT--The student will be able to:

16.01 Identify materials and precautions.
16.02 Repair/prepare surface.
16.03 Apply and prepare primer.
16.04 Apply masking and pull tapes.
16.05 Apply paint with spray equipment.

09.0 INSTALL WIRING SYSTEMS--The student will be able to:

- 09.01 Identify tools, materials, and precautions.
- 09.02 Install batteries.
- 09.03 Select DC conductor size.
- 09.04 Install DC service equipment.
- 09.05 Install DC lighting and motor circuits.
- 09.06 Install starting and charging circuits.
- 09.07 Install bonding and cathodic protection.
- 09.08 Install AC service equipment.
- 09.09 Install AC lighting and receptacle circuits.
- 09.10 Install on-board generator.

10.0 PERFORM FIBERGLASS FABRICATION--The student will be able to:

- 10.01 Operate chop gun.
- 10.02 Prepare and apply bonding putty.
- 10.03 Identify and apply core materials.
- 10.04 Fabricate parts by vacuum molding.
- 10.05 Prepare mold for gelcoat.
- 10.06 Operate gel gun.
- 10.07 Pull parts.
- 10.08 Repair molds.
- 10.09 Maintain molds.

11.0 PERFORM ASSEMBLY WOODWORKING OPERATIONS--The student will be able to:

- 11.01 Level hull and set up cross-beams.
- 11.02 Fabricate and install sub-sole components.
- 11.03 Fabricate and install sale.
- 11.04 Construct router, shaper, and tracing patterns.
- 11.05 Cut bulkheads from patterns.
- 11.06 Construct straight moldings and posts.
- 11.07 Construct turned corner moldings and posts.
- 11.08 Construct solid and laminated curved moldings.

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- 12.01 Identify components of lines drawings.
- 12.02 Lay down lines from offsets.
- 12.03 Pick up body plan.
- 12.04 Construct patterns and frames.
- 12.05 Construct, fasten, and fair stringers.
- 12.06 Apply planking material.

13.0 PERFORM PLUG FINISHING OPERATIONS--The student will be able to:

- 13.01 Glaze and sheath plug.
- 13.02 Fill and prime plug.
- 13.03 Fair plug.
- 13.04 Prepare and apply finish coat.
- 13.05 Polish finish coat.

14.0 CONSTRUCT MOLDS--The student will be able to:

- 14.01 Prepare plug for mold lamination.
- 14.02 Gel and skin mold.
- 14.03 Laminate mold.
- 14.04 Brace and pull mold.
- 14.05 Prepare mold for first use.

15.0 REPAIR FIBERGLASS--The student will be able to:

- 15.01 Install point loads and stiffeners.
- 15.02 Repair laminates.
- 15.03 Renew bottom paint.

16.0 APPLY PAINT--The student will be able to:

- 16.01 Identify materials and precautions.
- 16.02 Repair/prepare surface.
- 16.03 Apply and prepare primer.
- 16.04 Apply masking and pull tapes.
- 16.05 Apply paint with spray equipment.

17.0 REPAIR WOODEN BOATS--The student will be able to:

17.01 Identify wooden boat construction types.
17.02 Repair plank-on-frame construction.
17.03 Use epozy resin in restoration/repair.
17.04 Maintain wooden boats.

18.0 SERVICE MECHANICAL SYSTEMS--The student will be able to:

18.01 Perform routine engine service.
18.02 Maintain hydraulic steering systems.
18.03 Repair and maintain mechanical steering.
18.04 Inspect mast, boom, and rigging.
18.05 Repair rigging.

19.0 SERVICE PIPING AND WIRING SYSTEMS--The student will be able to:

19.01 Maintain and repair portable water systems.
19.02 Maintain and repair fuel systems.
19.03 Install and maintain sewage systems.
19.04 Troubleshoot DC systems.
19.05 Troubleshoot AC systems.

20.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

20.01 Conduct a job search.
20.02 Secure information about a job.
20.03 Identify documents which may be required when applying for a job interview.
20.04 Complete a job application form correctly.
20.05 Demonstrate competence in job interview techniques.
20.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
20.07 Identify acceptable work habits.
20.08 Demonstrate knowledge of how to make job changes appropriately.
20.09 Demonstrate acceptable employee health habits.

21.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

21.01 Define entrepreneurship.
21.02 Describe the importance of entrepreneurship to the American economy.
21.03 List the advantages and disadvantages of business ownership.
21.04 Identify the risks involved in ownership of a business.
21.05 Identify the necessary personal characteristics of a successful entrepreneur.
21.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Brick and Block Laying

CODE NUMBER: Secondary 8721200 Postsecondary ________

Florida CIP IN46.011200

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational _X_ Other 10-12, 21

CERTIFICATION COVERAGE: TEC CONSTR @ 7 TROWEL TR 7 BLDG CONST @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as Bricklayer Helpers (861.381-022) or as a Construction Worker I (869.664-014).

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, orientation to the industry, blueprint reading and specifications, related mathematics, properties and characteristics of brick, and trade terms.

Listed below are the courses that comprise this program when offered at the secondary level:

8721210	Brick and Block Laying 1
8721220	Brick and Block Laying 2
8721230	Brick and Block Laying 3
8721240	Brick and Block Laying 4
8721250	Brick and Block Laying 5
8721260	Brick and Block Laying 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in use and care of tools and equipment used in masonry to lay brick and block when constructing buildings and building components.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in performing basic masonry skills.
02. Demonstrate proficiency in using materials and mortar properly.
03. Demonstrate proficiency in performing construction practices/techniques to industry standards.
04. Demonstrate proficiency in constructing brick/masonry walls.
05. Demonstrate proficiency in performing construction details.
06. Demonstrate proficiency in performing cleaning operations.
07. Demonstrate employability skills.
08. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial SECONDARY NUMBER: 8721200
PROGRAM TITLE: Brick and Block Laying POSTSECONDARY NUMBER: ______

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing basic masonry skills, including industry orientation, safety, applied mathematics, identification and use of hand and power tools, recognition and reading of blueprints, and necessary industry-specific welding skills.

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING BASIC MASONRY SKILLS--The student will be able to:

01.01 **Complete Industry Orientation**
01.02 Trace the history of the Masonry Industry
01.03 Explain the importance of the construction industry to the local, state, and national economy
01.04 Identify available employment opportunities
01.05 Explain three factors involved in good workmanship
01.06 **Understand and Comply with Safety Rules and Regulations**
01.07 List personal safety rules
01.08 List general job safety rules
01.09 Demonstrate the correct way to lift heavy objects
01.10 Explain the purpose of the OSHA act
01.11 Qualify in applied basic first-aid procedure
01.12 **Demonstrate Applied Math Skills**
01.13 Calculate area and volume problems
01.14 Estimate materials needed for a specific job
01.15 Solve estimating problems
01.16 Solve basic ratio and proportion problems
01.17 **Identify and Use Hand Tools**
01.18 Identify hand tools
01.19 Distinguish between modular rule and brick spacing rule
01.20 List factors to consider when selecting a brick trowel
01.21 List basic rules concerning care of hand tools
01.22 List basic rules concerning safe use of hand tools
01.23 Demonstrate the proper use of hand tools
01.24 **Identify and Use Power Tools**
01.25 Identify power tools
01.26 List safety rules for operating a masonry saw
01.27 Cut masonry units using a table saw with an abrasive blade
01.28 Cut masonry units using a table saw with a diamond blade
01.29 Set up and operate power tools safely
01.30 **Differentiate Between and Read Blueprints**
01.31 Identify types of drawings
01.32 Identify symbols
01.33 List items found in a set of masonry symbols
01.34 List items on a detail drawing
01.35 Demonstrate the ability to use an architect's scale by scaling a drawing
01.36 Explain the difference between a plan view, an elevation, and a section on blueprints
01.37 Interpret a set of specifications
01.38 Demonstrate the ability to read and interpret simple blueprints
01.39 Interpret a finish schedule
01.40 Read and interpret local building codes and national standards
01.41 **Weld and Cut Metals (Optional in the program, but a Masonry graduate needs to possess these skills)**
01.42 Identify the parts of an oxyacetylene cutting outfit
01.43 Identify types of oxyacetylene cutting flames
01.44 List reasons for poor cuts
01.45 List reasons for backfires
01.46 Arrange, in order, steps to follow in case of flashbacks
01.47 Set up equipment for oxyacetylene cutting
01.48 Turn on, light, adjust to a neutral flame, and turn off oxyacetylene cutting equipment
01.49 Make a 90° cut in mild steel and restart a cut
01.50 Cut round stock
01.51 List types of arc welders
01.52 List types of electrodes

01.53 List sizes of electrodes
01.54 List factors to consider when selecting electrodes
01.55 Identify the steps of the welding process
01.56 Identify the kinds of welds
01.57 Identify the types of weld joints
01.58 List safety precautions pertaining to welding
01.59 Demonstrate the ability to use two methods to strike an arc
01.60 Start, stop, and restart a bead
01.61 Construct a pad weld
01.62 Construct a butt weld

02.0 DEMONSTRATE PROFICIENCY IN USING MATERIALS AND MORTAR PROPERLY --The student will be able to:

02.01 **Identify and State the Uses of Materials**
02.02 Identify 5 types of clay/brick used in the local area
02.03 Identify 5 types of Concrete Masonry Units (CMU) used in the local area
02.04 Identify 5 types of natural stone used in the local area
02.05 Identify concrete precast units (i.e., sills and lintels)
02.06 Identify masonry accessories used in the local area (i.e., wall ties, and wall reinforcement)
02.07 Label the parts of a brick
02.08 Distinguish between modular and nonmodular brick
02.09 Identify brick positioning in a wall
02.10 Identify shapes of concrete masonry units
02.11 List kinds of sills and lintels
02.12 List types of cut stone
02.13 List principal uses of refractory brick
02.14 Identify types of kilns used in brick manufacturing
02.15 Identify steps used in brick manufacturing
02.16 Describe procedures used to manufacture concrete block
02.17 **Identify Different Mortars and Grouts**
02.18 Identify mortar by components (aggregate, cementacious materials, and additives
02.19 Identify types of mortar (M, N, S, and O) and proportioning
02.20 Identify colored mortars (admix and factory blended)
02.21 Identify types and purposes of grouts for reinforced to nonreinforced masonry

03.0 DEMONSTRATE PROFICIENCY IN PERFORMING CONSTRUCTION PRACTICES/TECHNIQUES TO INDUSTRY STANDARDS --The student will be able to:

03.01 **Lay Out Structures**
03.02 Identify methods of layout
03.03 Identify types of bonds
03.04 Identify load-bearing and nonload-bearing walls
03.05 List types of reinforced masonry
03.06 Identify types of through-wall bonding
03.07 Identify types of flashing
03.08 Identify types of leads
03.09 Identify types of tooling
03.10 Establish building layouts
03.11 Use a transit to establish level
03.12 Erect batter boards and locate building lines
03.13 Square boarding using the 6-8-10 rule
03.14 Make a story pole
03.15 Identify measuring tools
03.16 List uses of modular and spacing rules
03.17 Identify symbols and abbreviations
03.18 List items found in a set of masonry symbols
03.19 List items on a detail drawing
03.10 Scale a drawing using an architect's scale
03.21 Read and interpret a simple blueprint
03.22 Interpret a finish schedule
03.23 Identify types of levels
03.24 Identify types of self-reading rods
03.25 List common errors contributing to incorrect measurements
03.26 Identify hand motions used by an instrument person
03.27 Read a self-reading rod
03.28 Set up and adjust a builder's level

Brick and Block Laying - Continued

03.29 **Lay Foundations**
03.30 Lay out footings
03.31 Place rebar
03.32 Place and rough finish concrete
03.33 Lay out and establish grades for foundations
03.34 Establish corners and lay out concrete block according to a specific bonding plan
03.35 Lay foundation walls to joist and brick shelf height
03.36 Waterproof foundation walls
03.37 Install flashing, anchor bolts, termite shields, and weep holes
03.38 **Mix and Blend Mortars and Brick**
03.39 Identify tools and equipment used for mixing mortar
03.40 List factors affecting the consistency of mortar
03.41 List common ratios of mortar mixtures
03.42 Mix types of mortar (M, N, S, and O) mechanically and by hand
03.43 Retemper mortar
03.44 Mix tuck-pointing mortar
03.45 Blend brick according to the color range
03.46 **Spread Mortar and Lay Brick and Block**
03.47 Demonstrate the correct way to hold a trowel
03.48 Demonstrate the ability to manipulate a trowel
03.49 Select the proper trowel for laying brick
03.50 Demonstrate the cupping method of picking up mortar for brick
03.51 Identify methods of picking up mortar from the mortar board
03.52 Identify the direction of travel when placing mortar while laying brick
03.53 Identify types of bedding
03.54 Demonstrate the pick and dip method for laying brick
03.55 Demonstrate the method for spreading mortar for brick
03.56 Demonstrate different styles of cross-head joints
03.57 Spread mortar on a 2 x 2 for brick
03.58 Identify methods of putting up the line
03.59 Lay brick to the line with established leads
03.60 Build a 90° brick lead
03.61 Select the proper trowel for laying block
03.62 Demonstrate the method for picking up mortar for block
03.63 Demonstrate the method for face-shell spreading of mortar for block
03.64 Spread mortar on a 2 x 4 for block
03.65 Lay block to the line with established leads
03.66 Build a 90° block lead
03.67 **Lay Out the Bond**
03.68 Lay out the first two courses for bonding
03.69 Lay out using English cross bond
03.70 Lay out using Flemish cross bond
03.71 Lay out using Dutch cross bond
03.72 Lay out using 1/3 bond
03.73 Lay out using stack bond
03.74 Lay out using running bond
03.75 Lay out using common bond
03.76 Demonstrate the ability to lay brick in soldier position
03.77 Demonstrate the ability to lay brick in header position
03.78 Demonstrate the ability to lay brick in rowlock position
03.79 Demonstrate the ability to lay brick in sailor position
03.80 **Identify and Install Different Types of Flashing**
03.81 Identify types of flashing
03.82 Install a base through wall cavity wall flashing
03.83 Install brick veneer base flashing
03.84 Install flashing in reglet
03.85 Install flashing for sills and heads of openings
03.86 **Identify and Install Wall Reinforcments and Ties**
03.87 Identify four types of joint reinforcement used locally
03.88 Install truss or ladder-wall reinforcing
03.89 Install dovetail anchors, adjustable wall ties, and corrugated veneer ties
03.90 Identify methods of layout
03.91 Identify types of bonds
03.92 Identify load-bearing and nonload-bearing walls
03.93 List types of reinforced masonry
03.94 List factors to consider when building a cavity wall
03.95 Identify types of through-wall bonding
03.96 List types of reinforcement

03.97 **Tool and Point Joints and Walls**
03.98 Tool concave joints
03.99 Tool rake joints
03.100 Tool weather joints
03.101 Tool V-jointer joints
03.102 Tool grapevine joints
03.103 Tool stuck joints
03.104 Cut/rough joints
03.105 Tuck-point a wall
03.106 Brush and touch-up a wall
03.107 **Erect and Inspect Scaffolding**
03.108 Erect and inspect scaffolding in accordance with OSHA standards

04.0 DEMONSTRATE PROFICIENCY IN CONSTRUCTING BRICK/MASONRY WALLS--The student will be able to:

04.01 Set up the job
04.02 Arrange masonry materials for efficient use
04.03 Place mortar pans properly
04.04 Temper or shake-up mortar with the proper shovels
04.05 Lay out the structure
04.06 Lay out the bond
04.07 Establish corners and leads
04.08 Pull the line
04.09 Lay the specified masonry materials to job plan

05.0 DEMONSTRATE PROFICIENCY IN PERFORMING CONSTRUCTION DETAILS--The student will be able to:

05.01 Identify 5 types of arches (flat, jack, Gothic, semi-circle, Corinthian)
05.02 List purposes of arches
05.03 Identify types of paving
05.04 Identify types of paving patterns
05.05 List purposes of masonry paving
05.06 Identify types of precast panels
05.07 List purposes of grouting
05.08 Construct paving using a given plan
05.09 Construct a column using a given plan
05.10 Construct a pier using a given plan
05.11 Lay out and construct arches from given plans
05.12 Identify types of fireplaces
05.13 List factors to consider when constructing fireplaces and chimneys
05.14 List characteristics of firebrick
05.15 Distinguish between firebrick mortar and brick mortar
05.16 Demonstrate the ability to butter firebrick
05.17 Construct a firebox
05.18 Construct a fireplace
05.19 Identify components of fireplaces and chimneys
05.20 Lay out and construct a fireplace and chimney to given plans
05.21 Lay out a wall section using glass block or other new local materials

06.0 DEMONSTRATE PROFICIENCY IN PERFORMING CLEANING OPERATIONS--The student will be able to:

06.01 List reasons for cleaning
06.02 Identify cleaning equipment
06.03 List types of cleaning material
06.04 Identify pointing tools
06.05 Point new work
06.06 Point old work
06.07 List reasons for caulking
06.08 Match types of calking to specific uses
06.09 Identify caulking tools
06.10 Caulk expansion joints
06.11 List safety precautions to follow when cleaning
06.12 Identify 5 methods of wall cleaning
06.13 Prepare cleaning solutions
06.14 Prepare the wall
06.15 Wash the wall

07.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

07.01 Conduct a job search
07.02 Secure information about a job
07.03 Identify documents that may be required when applying for a job
07.04 Complete a job application form correctly
07.05 Demonstrate competence in job interview techniques
07.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
07.07 Identify acceptable work habits
07.08 Demonstrate knowledge of how to make job changes appropriately
07.09 Demonstrate acceptable employee health habits

08.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

08.01 Define entrepreneurship
08.02 Describe the importance of entrepreneurship to the American economy
08.03 List the advantages and disadvantages of business ownership
08.04 Identify the risks involved in ownership of a business
08.05 Identify the necessary personal characteristics of a successful entrepreneur
08.06 Identify the business skills needed to operate a small business efficiently and effectively

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Brick and Block Laying
PROGRAM NUMBER: 8721200
COURSE TITLE: Brick and Block Laying 1
COURSE NUMBER: 8721210

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing basic masonry skills, including industry orientation, safety, applied mathematics, identification and use of hand and power tools, recognition and reading of blueprints, and necessary industry-specific welding skills.

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING BASIC MASONRY SKILLS--The student will be able to:

01.01 **Complete Industry Orientation**
01.02 Trace the history of the Masonry Industry
01.03 Explain the importance of the construction industry to the local, state, and national economy
01.04 Identify available employment opportunities
01.05 Explain three factors involved in good workmanship
01.06 **Understand and Comply with Safety Rules and Regulations**
01.07 List personal safety rules
01.08 List general job safety rules
01.09 Demonstrate the correct way to lift heavy objects
01.10 Explain the purpose of the OSHA act
01.11 Qualify in applied basic first-aid procedure
01.12 **Demonstrate Applied Math Skills**
01.13 Calculate area and volume problems
01.14 Estimate materials needed for a specific job
01.15 Solve estimating problems
01.16 Solve basic ratio and proportion problems
01.17 **Identify and Use Hand Tools**
01.18 Identify hand tools
01.19 Distinguish between modular rule and brick spacing rule
01.20 List factors to consider when selecting a brick trowel
01.21 List basic rules concerning care of hand tools
01.22 List basic rules concerning safe use of hand tools
01.23 Demonstrate the proper use of hand tools
01.24 **Identify and Use Power Tools**
01.25 Identify power tools
01.26 List safety rules for operating a masonry saw
01.27 Cut masonry units using a table saw with an abrasive blade
01.28 Cut masonry units using a table saw with a diamond blade
01.29 Set up and operate power tools safely
01.30 **Differentiate Between and Read Blueprints**
01.31 Identify types of drawings
01.32 Identify symbols
01.33 List items found in a set of masonry symbols
01.34 List items on a detail drawing
01.35 Demonstrate the ability to use an architect's scale by scaling a drawing
01.36 Explain the difference between a plan view, an elevation, and a section on blueprints
01.37 Interpret a set of specifications
01.38 Demonstrate the ability to read and interpret simple blueprints
01.39 Interpret a finish schedule
01.40 Read and interpret local building codes and national standards
01.41 **Weld and Cut Metals (Optional in the program, but a Masonry graduate needs to possess these skills)**
01.42 Identify the parts of an oxyacetylene cutting outfit
01.43 Identify types of oxyacetylene cutting flames
01.44 List reasons for poor cuts
01.45 List reasons for backfires
01.46 Arrange, in order, steps to follow in case of flashbacks
01.47 Set up equipment for oxyacetylene cutting
01.48 Turn on, light, adjust to a neutral flame, and turn off oxyacetylene cutting equipment
01.49 Make a 90° cut in mild steel and restart a cut
01.50 Cut round stock

Brick and Block Laying 1 - Continued

01.51 List types of arc welders
01.52 List types of electrodes
01.53 List sizes of electrodes
01.54 List factors to consider when selecting electrodes
01.55 Identify the steps of the welding process
01.56 Identify the kinds of welds
01.57 Identify the types of weld joints
01.58 List safety precautions pertaining to welding
01.59 Demonstrate the ability to use two methods to strike an arc
01.60 Start, stop, and restart a bead
01.61 Construct a pad weld
01.62 Construct a butt weld

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Brick and Block Laying
PROGRAM NUMBER: 8721200
COURSE TITLE: Brick and Block Laying 2
COURSE NUMBER: 8721220

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for using materials and mortar properly.

02.0 DEMONSTRATE PROFICIENCY IN USING MATERIALS AND MORTAR PROPERLY
--The student will be able to:

02.01 **Identify and State the Uses of Materials**
02.02 Identify 5 types of clay/brick used in the local area
02.03 Identify 5 types of Concrete Masonry Units (CMU) used in the local area
02.04 Identify 5 types of natural stone used in the local area
02.05 Identify concrete precast units (i.e., sills and lintels)
02.06 Identify masonry accessories used in the local area (i.e., wall ties, and wall reinforcement)
02.07 Label the parts of a brick
02.08 Distinguish between modular and nonmodular brick
02.09 Identify brick positioning in a wall
02.10 Identify shapes of concrete masonry units
02.11 List kinds of sills and lintels
02.12 List types of cut stone
02.13 List principal uses of refractory brick
02.14 Identify types of kilns used in brick manufacturing
02.15 Identify steps used in brick manufacturing
02.16 Describe procedures used to manufacture concrete block
02.17 **Identify Different Mortars and Grouts**
02.18 Identify mortar by components (aggregate, cementacious materials, and additives
02.19 Identify types of mortar (M, N, S, and O) and proportioning
02.20 Identify colored mortars (admix and factory blended)
02.21 Identify types and purposes of grouts for reinforced to nonreinforced masonry

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STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Brick and Block Laying
PROGRAM NUMBER: 8721200
COURSE TITLE: Brick and Block Laying 3
COURSE NUMBER: 8721230

COURSE DESCRIPTION:

This course is designed to provide instruction in performing construction practices and techniques to industry standards, including laying out structures and foundations; mixing, blending and spreading mortars; blending and laying brick; bonds, flashing and wall reinforcements and ties; tooling and pointing joints and walls; and erecting scaffolding.

03.0 DEMONSTRATE PROFICIENCY IN PERFORMING CONSTRUCTION PRACTICES/TECHNIQUES TO INDUSTRY STANDARDS --The student will be able to:

03.01 **Lay Out Structures**
03.02 Identify methods of layout
03.03 Identify types of bonds
03.04 Identify load-bearing and nonload-bearing walls
03.05 List types of reinforced masonry
03.06 Identify types of through-wall bonding
03.07 Identify types of flashing
03.08 Identify types of leads
03.09 Identify types of tooling
03.10 Establish building layouts
03.11 Use a transit to establish level
03.12 Erect batter boards and locate building lines
03.13 Square boarding using the 6-8-10 rule
03.14 Make a story pole
03.15 Identify measuring tools
03.16 List uses of modular and spacing rules
03.17 Identify symbols and abbreviations
03.18 List items found in a set of masonry symbols
03.19 List items on a detail drawing
03.10 Scale a drawing using an architect's scale
03.21 Read and interpret a simple blueprint
03.22 Interpret a finish schedule
03.23 Identify types of levels
03.24 Identify types of self-reading rods
03.25 List common errors contributing to incorrect measurements
03.26 Identify hand motions used by an instrument person
03.27 Read a self-reading rod
03.28 Set up and adjust a builder's level
03.29 **Lay Foundations**
03.30 Lay out footings
03.31 Place rebar
03.32 Place and rough finish concrete
03.33 Lay out and establish grades for foundations
03.34 Establish corners and lay out concrete block according to a specific bonding plan
03.35 Lay foundation walls to joist and brick shelf height
03.36 Waterproof foundation walls
03.37 Install flashing, anchor bolts, termite shields, and weep holes
03.38 **Mix and Blend Mortars and Brick**
03.39 Identify tools and equipment used for mixing mortar
03.40 List factors affecting the consistency of mortar
03.41 List common ratios of mortar mixtures
03.42 Mix types of mortar (M, N, S, and O) mechanically and by hand
03.43 Retemper mortar
03.44 Mix tuck-pointing mortar
03.45 Blend brick according to the color range
03.46 **Spread Mortar and Lay Brick and Block**
03.47 Demonstrate the correct way to hold a trowel
03.48 Demonstrate the ability to manipulate a trowel
03.49 Select the proper trowel for laying brick
03.50 Demonstrate the cupping method of picking up mortar for brick
03.51 Identify methods of picking up mortar from the mortar board
03.52 Identify the direction of travel when placing mortar while laying brick
03.53 Identify types of bedding
03.54 Demonstrate the pick and dip method for laying brick
03.55 Demonstrate the method for spreading mortar for brick
03.56 Demonstrate different styles of cross-head joints
03.57 Spread mortar on a 2 x 2 for brick
03.58 Identify methods of putting up the line

Brick and Block Laying 3 - Continued

03.59 Lay brick to the line with established leads
03.60 Build a 90° brick lead
03.61 Select the proper trowel for laying block
03.62 Demonstrate the method for picking up mortar for block
03.63 Demonstrate the method for face-shell spreading of mortar for block
03.64 Spread mortar on a 2 x 4 for block
03.65 Lay block to the line with established leads
03.66 Build a 90° block lead
03.67 **Lay Out the Bond**
03.68 Lay out the first two courses for bonding
03.69 Lay out using English cross bond
03.70 Lay out using Flemish cross bond
03.71 Lay out using Dutch cross bond
03.72 Lay out using 1/3 bond
03.73 Lay out using stack bond
03.74 Lay out using running bond
03.75 Lay out using common bond
03.76 Demonstrate the ability to lay brick in soldier position
03.77 Demonstrate the ability to lay brick in header position
03.78 Demonstrate the ability to lay brick in rowlock position
03.79 Demonstrate the ability to lay brick in sailor position
03.80 **Identify and Install Different Types of Flashing**
03.81 Identify types of flashing
03.82 Install a base through wall cavity wall flashing
03.83 Install brick veneer base flashing
03.84 Install flashing in reglet
03.85 Install flashing for sills and heads of openings
03.86 **Identify and Install Wall Reinforcments and Ties**
03.87 Identify four types of joint reinforcement used locally
03.88 Install truss or ladder-wall reinforcing
03.89 Install dovetail anchors, adjustable wall ties, and corrugated veneer ties
03.90 Identify methods of layout
03.91 Identify types of bonds
03.92 Identify load-bearing and nonload-bearing walls
03.93 List types of reinforced masonry
03.94 List factors to consider when building a cavity wall
03.95 Identify types of through-wall bonding
03.96 List types of reinforcement
03.97 **Tool and Point Joints and Walls**
03.98 Tool concave joints
03.99 Tool rake joints
03.100 Tool weather joints
03.101 Tool V-jointer joints
03.102 Tool grapevine joints
03.103 Tool stuck joints
03.104 Cut/rough joints
03.105 Tuck-point a wall
03.106 Brush and touch-up a wall
03.107 **Erect and Inspect Scaffolding**
03.108 Erect and inspect scaffolding in accordance with OSHA standards

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STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Brick and Block Laying

PROGRAM NUMBER: 8721200

COURSE TITLE: Brick and Block Laying 4

COURSE NUMBER: 8721240

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for constructing brick or masonry walls.

04.0 DEMONSTRATE PROFICIENCY IN CONSTRUCTING BRICK/MASONRY WALLS--The student will be able to:

04.01 Set up the job
04.02 Arrange masonry materials for efficient use
04.03 Place mortar pans properly
04.04 Temper or shake-up mortar with the proper shovels
04.05 Lay out the structure
04.06 Lay out the bond
04.07 Establish corners and leads
04.08 Pull the line
04.09 Lay the specified masonry materials to job plan

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Brick and Block Laying

PROGRAM NUMBER: 8721200

COURSE TITLE: Brick and Block Laying 5

COURSE NUMBER: 8721250

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for identification and building of architectural other construction details.

05.0 DEMONSTRATE PROFICIENCY IN PERFORMING CONSTRUCTION DETAILS--The student will be able to:

05.01 Identify 5 types of arches (flat, jack, Gothic, semi-circle, Corinthian)
05.02 List purposes of arches
05.03 Identify types of paving
05.04 Identify types of paving patterns
05.05 List purposes of masonry paving
05.06 Identify types of precast panels
05.07 List purposes of grouting
05.08 Construct paving using a given plan
05.09 Construct a column using a given plan
05.10 Construct a pier using a given plan
05.11 Lay out and construct arches from given plans
05.12 Identify types of fireplaces
05.13 List factors to consider when constructing fireplaces and chimneys
05.14 List characteristics of firebrick
05.15 Distinguish between firebrick mortar and brick mortar
05.16 Demonstrate the ability to butter firebrick
05.17 Construct a firebox
05.18 Construct a fireplace
05.19 Identify components of fireplaces and chimneys
05.20 Lay out and construct a fireplace and chimney to given plans
05.21 Lay out a wall section using glass block or other new local materials

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STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Brick and Block Laying

PROGRAM NUMBER: 8721200

COURSE TITLE: Brick and Block Laying 6

COURSE NUMBER: 8721260

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for cleaning brick and masonry and for demonstrating employability skills.

06.0 DEMONSTRATE PROFICIENCY IN PERFORMING CLEANING OPERATIONS--The student will be able to:

06.01 List reasons for cleaning
06.02 Identify cleaning equipment
06.03 List types of cleaning material
06.04 Identify pointing tools
06.05 Point new work
06.06 Point old work
06.07 List reasons for caulking
06.08 Match types of calking to specific uses
06.09 Identify caulking tools
06.10 Caulk expansion joints
06.11 List safety precautions to follow when cleaning
06.12 Identify 5 methods of wall cleaning
06.13 Prepare cleaning solutions
06.14 Prepare the wall
06.15 Wash the wall

07.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

07.01 Conduct a job search
07.02 Secure information about a job
07.03 Identify documents that may be required when applying for a job
07.04 Complete a job application form correctly
07.05 Demonstrate competence in job interview techniques
07.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
07.07 Identify acceptable work habits
07.08 Demonstrate knowledge of how to make job changes appropriately
07.09 Demonstrate acceptable employee health habits

08.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

08.01 Define entrepreneurship
08.02 Describe the importance of entrepreneurship to the American economy
08.03 List the advantages and disadvantages of business ownership
08.04 Identify the risks involved in ownership of a business
08.05 Identify the necessary personal characteristics of a successful entrepreneur
08.06 Identify the business skills needed to operate a small business efficiently and effectively

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Broadcasting Technology

CODE NUMBER: Secondary ______ Postsecondary RTV0996

Florida CIP IN10.010401

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-15

CERTIFICATION COVERAGE: TEC ELEC @ 7 TV PRO TEC 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment with occupational titles as radio announcers (159.147-010), broadcast technicians (249.387-010), radio producers (159.117-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, announcing and moderating programs, preparing copy, programming, and operation of audio broadcasting equipment to support broadcast managers in the production of materials and production and broadcasting of materials or programs in radio format.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in a wide variety of radio station positions to enhance students' employability and versatility upon completion of the program. Lab activities include operation of equipment, copy writing spots, weather, news, sound effects, taping, editing, transfers, and voice and speech control.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

An Federal Communications Commission radio telephone third class license is required for employment in most positions in radio stations. Appropriate preparation for the exam is a part of the content of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 12.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 780 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of procedures.
02. Demonstrate appropriate broadcast speaking manner.
03. Operate control room equipment.
04. Demonstrate radio broadcasting skills.
05. Explain and demonstrate news broadcasting.

06. Write broadcast news.
07. Explain and demonstrate ability to properly control radio traffic.
08. Write commercial copy.
09. Explain programming concepts.
10. Describe business aspects of broadcasting.
11. Explain surveys and demographics.
12. Explain rules and regulations governing radio broadcasts.
13. Perform radio broadcasting functions.
14. Demonstrate competencies requires for Federal Communications Commission radio telephone third class license.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial SECONDARY NUMBER: ____

PROGRAM TITLE: Broadcasting Technology POSTSECONDARY NUMBER: RTV0996

01.0 DEMONSTRATE KNOWLEDGE OF PROCEDURES--The student will be able to:

01.01 Verbalize the rules and procedures of school and class.
01.02 Explain the structure of the broadcast industry, the radio station, and his role in the station's operation.
01.03 State the nature of the instruction, what he will learn in relation to his stated goals and the job opportunities that exist.

02.0 DEMONSTRATE APPROPRIATE BROADCAST SPEAKING MANNER--The student will be able to:

02.01 Identify and correct his own vocal deficiencies.
02.02 Demonstrate his ability to breathe properly, project and control loudness, resonate his voice and vary tone, pitch and pace.
02.03 Articulate and pronounce words according to accepted standards.
02.04 Real aloud in a professional manner.

03.0 OPERATE CONTROL ROOM EQUIPMENT--The student will be able to:

03.01 Demonstrate a working familiarity and understanding of the functions of a control console.
03.02 State the characteristics of various microphones and demonstrate the ability to use them.
03.03 Demonstrate knowledge of and ability to operate turntables, tape recorders, cart recorders and playbacks.
03.04 Handle outside organizations through the console.
03.05 Demonstrate how to handle the audio portion of a deejay show and news program, putting together all the elements of audio control in radio.
03.06 Demonstrate ability to work as an audio control operator in TV studio production.

04.0 DEMONSTRATE RADIO BROADCASTING SKILLS--The student will be able to:

04.01 Outline the qualifications and requirements of a radio announcer.
04.02 Demonstrate development of the skills of announcing, the various techniques of delivery and procedures according to accepted standards.
04.03 Demonstrate the ability to perform to standards before a TV camera, visually and orally.
04.04 Perform the various assignments in a professional manner, for both radio and TV, according to industry standards.

05.0 EXPLAIN AND DEMONSTRATE NEWS BROADCASTING--The student will be able to:

05.01 Differentiate between news, commentary, and editorials.
05.02 Demonstrate ability to mark, edit, and present news in an acceptable manner.
05.03 Demonstrate ability to use the various equipment of a newsroom.
05.04 Explain the various sources of news and how they are used.
05.05 Demonstrate ability to ad-lib from the scene, interview guests, and type news stories.

06.0 WRITE BROADCAST NEWS--The student will be able to:

06.01 List the elements that constitute news materials and evaluate them.
06.02 Demonstrate ability to write news stories in broadcast style.

07.0 EXPLAIN AND DEMONSTRATE ABILITY TO PROPERLY CONTROL RADIO TRAFFIC--The student will be able to:

07.01 State the duties of the traffic department.
07.02 List the elements and procedures of log-keeping.
07.03 Demonstrate a working knowledge of the rules and regulations pertaining to traffic control and standards of performance.

08.0 WRITE COMMERCIAL COPY--The student will be able to:

08.01 Explain the job of a copy writer and outline the elements of good copy.

08.02 Demonstrate ability to write commercial continuity in it various forms.
08.03 Demonstrate ability to select and utilize music and sound effects in the production of recorded copy.
08.04 Demonstrate ability to edit, splice, dub, overlap sound or otherwise utilize various production techniques.

09.0 EXPLAIN PROGRAMMING CONCEPTS--The student will be able to:

09.01 List and explain the various functions under the control of the program director.
09.02 Differentiate between formats used in large and small markets.
09.03 Explain various methods of station promotion, types of contests including procedures and rules.
09.04 Explain the techniques and procedures of networks, syndication, news, talk, sports, special events, public service and music programs.

10.0 EXPLAIN BUSINESS ASPECTS OF BROADCASTING--The student will be able to:

10.01 Explain the determination of cost and expense involved in station operation, the financial structure, the evaluation of time to the station and its clients.
10.02 List procedures and techniques of radio sales and demonstrate the ability to use maps, rate cards, contracts, etc., in accordance with station practice.
10.03 Explain the requirements and regulations of station ownership.
10.04 Describe the development of media advertising and explain the various forms utilized in the industry today.

11.0 EXPLAIN SURVEYS AND DEMOGRAPHICS--The student will be able to:

11.01 Explain the methods of measurement used by broadcasters and evaluate their function in the overall operation of a station.
11.02 Outline the methodology of pulse, ARB, and explain the use of the SRDS.

12.0 EXPLAIN RULES AND REGULATIONS GOVERNING RADIO BROADCASTS--The student will be able to:

12.01 Demonstrate an understanding of the rules and regulations governing licenses, measurement and records, political broadcasts, and lottery laws.

13.0 PERFORM RADIO BROADCASTING FUNCTIONS--The student will be able to:

13.01 Perform to high standards in the role of audio operator, announcer, deejay, newsman, interviewer and production man, in varied format situations.

14.0 DEMONSTRATE COMPETENCIES REQUIRED FOR FEDERAL COMMUNICATIONS COMMISSION RADIO-TELEPHONE THIRD CLASS LICENSE--The student will be able to:

14.01 Pass the examination (F. C. C.) for Radio-Telephone Operator's License (Third) with broadcast endorsement.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job interview.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK **PROGRAM AREA:** Industrial

FLORIDA DEPARTMENT OF EDUCATION **EFFECTIVE DATE:** July, 1987

PROGRAM TITLE: Building Construction Technology

CODE NUMBER: Secondary ______ Postsecondary BCT0050

Florida CIP IN15.010101

SECONDARY SCHOOL CREDITS ______ **COLLEGE CREDITS** ______ **POSTSECONDARY ADULT VOCATIONAL CREDITS** ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-15

CERTIFICATION COVERAGE: TEC CONSTR @ 7 BLDG CONST @ 7 CARPENTRY 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as building construction technicians NSP, house builders (869.281-014), building inspectors (182.267-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, construction practices, building codes, blueprint reading, personnel and resource management skills, safety, site selection and planning and building residential and commercial structures.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in steel and wood construction methods, construction materials, occupational safety, building codes, and building inspections.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1600 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Communicate effectively.
02. Identify, select and supervise application of construction materials.
03. Produce, read and interpret drawings and specifications.
04. Interpret and apply codes, regulations, and contract documents.
05. Survey and investigate construction sites.
06. Select and maintain construction site tools and equipment.
07. Interpret basic designs and apply sound construction principles.
08. Take off quantities and estimate costs.

09. Plan, coordinate, schedule and control projects.
10. Perform tests and inspections.
11. Select, train and supervise personnel.
12. Demonstrate efficient office and administrative procedures.
13. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS

BUILDING CONSTRUCTION TECHNOLOGY

01.0 COMMUNICATE EFFECTIVELY — The student will be able to:

01.01 Maintain notice board.
01.02 Maintain job diary.
01.03 Prepare inter-office memos.
01.04 Prepare business correspondence.
01.05 Set-up surveyors field book.
01.06 Prepare daily project report.
01.07 Prepare requisitions for equipment and materials.
01.08 Write specifications for equipment purchase.
01.09 Prepare minutes from job-site meetings.

02.0 IDENTIFY, SELECT, AND SUPERVISE APPLICATION OF CONSTRUCTION MATERIALS — The student will be able to:

02.01 Select cleaning materials.
02.02 Select soils.
02.03 Identify soil types.
02.04 Select wood framing.
02.05 Select rough hardware.
02.06 Select waterproofing and protective coatings.
02.07 Select insulation and vapor barriers.
02.08 Select ceiling finishes and wall finishes.
02.09 Select form work materials.
02.10 Select concrete.
02.11 Select windows and doors.
02.12 Select adhesives and sealants.
02.13 Select roofing materials.
02.14 Select sheet metal materials.
02.15 Select mill work.
02.16 Select painting and decorating materials.
02.17 Select miscellaneous metals.
02.18 Select asphaltic materials.
02.19 Select masonry materials.
02.20 Select manufactured specialties.
02.21 Select reinforcing concrete materials.
02.22 Select structural steel.
02.23 Select finishing hardware.
02.24 Select foundation piling and casing material.
02.25 Select precast concrete materials.
02.26 Select plumbing and drainage material.
02.27 Select electrical components and equipment.
02.28 Identify mechanical components and equipment.

03.0 PRODUCE, READ, AND INTERPRET DRAWINGS AND SPECIFICATIONS — The student will be able to:

03.01 Identify, select and use drafting instruments.
03.02 Use technical lettering.
03.03 Identify and use architectural symbols.
03.04 Use drafting reproduction equipment.
03.05 Take site notes and measurements.
03.06 Identify and use electrical symbols.
03.07 Prepare site sketches.
03.08 Identify and use mechanical symbols.
03.09 Identify and use topographical symbols.
03.10 Interpret land surveyor's notes.
03.11 Prepare topographic drawings.
03.12 Prepare working sketches and "as built" drawings.
03.13 Prepare architectural drawings.
03.14 Interpret architectural drawings and specifications.
03.15 Evaluate finishing hardware schedules.
03.16 Prepare structural drawings.
03.17 Interpret structural drawings and specifications.
03.18 Interpret reinforcing steel drawings and bar list.
03.19 Interpret and apply A.S.T.M. standards.
03.20 Intrepret and apply C.S.A. standards.
03.21 Prepare presentation drawings.
03.22 Evaluate shop drawings.

03.23 Prepare mechanical drawings.
03.24 Interpret mechanical drawings and specifications.
03.25 Prepare electrical drawings.
03.26 Interpret electrical drawings and specifications.

04.0 INTERPRET AND APPLY LAWS, CODES, REGULATIONS, AND CONTRACT DOCUMENTS — The student will be able to:

04.01 Interpret federal and state safety codes.
04.02 Interpret pre-qualification documents.
04.03 Interpret, apply, and control addenda.
04.04 Interpret bonding insurance procedures.
04.05 Interpret, apply, and control change orders.
04.06 Interpret and apply state standard building code.
04.07 Interpret and apply workmen's compensation requirements.
04.08 Interpret and apply standard form of tender.
04.09 Compile a complete set of contract documents.
04.10 Interpret and apply contracts and mechanics lien act.

05.0 SURVEY AND INVESTIGATE CONSTRUCTION SITES — The student will be able to:

05.01 Lay out and measure site.
05.02 Use surveying rods.
05.03 Make measurements utilizing surveying rods and levels.
05.04 Make measurement using transit.
05.05 Survey construction sites.
05.06 Evaluate site and existing services for services required.
05.07 Survey and lay out building lines and levels.
05.08 Use digital and electronic survey equipment.
05.09 Identify types of sub surface investigations.
05.10 Determine sample requirements.
05.11 Conduct soil test.
05.12 Interpret soil reports.
05.13 Conduct vane shear test.
05.14 Compile boring log.

06.0 SELECT AND MAINTAIN CONSTRUCTION SITE TOOLS AND EQUIPMENT — The student will be able to:

06.01 Select fire fighting equipment.
06.02 Select and maintain safety equipment
06.03 Select cleaning equipment.
06.04 Select miscellaneous small tools.
06.05 Select and maintain shop and power tools.
06.06 Select surveying equipment.
06.07 Select concrete finishing equipment.
06.08 Select plaster and mortar mixing equipment.
06.09 Select and maintain temporary site offices, storage, and restroom facilities.
06.10 Select temporary building enclosures.
06.11 Select concrete placing equipment.
06.12 Prepare equipment service schedules.
06.13 Evaluate type and size of earth moving equipment needed for the project.
06.14 Select and maintain construction site communication equipment.
06.15 Select concrete batching and mixing equipment.
06.16 Select compaction equipment.
06.17 Identify pile driving and earth boring equipment.
06.18 Select and maintain temporary power and lighting equipment.
06.19 Select and maintain temporary water services.
06.20 Select demolition equipment.
06.21 Select balance of power and plant equipment.

07.0 INTERPRET BASIC DESIGNS AND APPLY CONSTRUCTION PRINCIPLES — The student will be able to:

07.01 Design, erect and maintain staging, scaffolding and falsework.
07.02 Coordinate and supervise resilient flooring.
07.03 Coordinate and supervise painting and finishes.
07.04 Coordinate and supervise windows and doors.
07.05 Coordinate and supervise carpentry and millwork.

07.06 Coordinate and supervise concrete and formwork.
07.07 Coordinate and supervise miscellaneous roofing and sheet metal.
07.08 Coordinate and supervise miscellaneous metal.
07.09 Plan and coordinate excavation and foundation work.
07.10 Coordinate and supervise lath and plaster and dry wall.
07.11 Identify modular and prefabricated applications.
07.12 Coordinate and supervise masonry work.
07.13 Coordinate and supervise tile and terrazzo.
07.14 Design concrete mix.
07.15 Determine strength of concrete.
07.16 Calculate temporary electrical power requirements.
07.17 Design asphaltic hot mix.
07.18 Design pavement structure.
07.19 Calculate modules of electricity.
07.20 Determine moments of inertia.
07.21 Calculate shears and bending moments.
07.22 Calculate deflection.
07.23 Calculate columns.
07.24 Determine strength of lumber.
07.25 Determine strength of steel.
07.26 Design forms and supports.
07.27 Coordinate and supervise structural steel work.
07.28 Coordinate and supervise mechanical work.
07.29 Coordinate and supervise elevator installation.
07.30 Coordinate and supervise electrical installation.

08.0 TAKE OFF QUANTITIES AND ESTIMATE COSTS — The student will be able to:

08.01 Make calculations.
08.02 Estimate quantities of concrete.
08.03 Compile lists of sub-trades for project.
08.04 Take off quantities of paving.
08.05 Estimate quantities of rough carpentry.
08.06 Obtain and build up material costs.
08.07 Interpret contract document.
08.08 Estimate quantities of framework.
08.09 Estimate quantities of excavation and fill.
08.10 Estimate quantities of landscaping.
08.11 Call sub trade tenders.
08.12 Take off quantities of miscellaneous metals.
08.13 Take off quantities of millwork.
08.14 Take off quantities of structural steel.
08.15 Take off quantities of manufactured specialities.
08.16 Analyze and project plant and equipment costs.
08.17 Analyze and project general condition costs.
08.18 Analyze and project labor unit costs.
08.19 Estimate quantities of reinforcing steel.
08.20 Estimate quantities of masonry.
08.21 Analyze and project site overhead costs.
08.22 Evaluate sub trade bids.
08.23 Summarize project cost and complete tenders prices.

09.0 PLAN, COORDINATE, SCHEDULE AND CONTROL PROJECTS — The student will be able to:

09.01 Prepare daily time sheets.
09.02 Record and control materials received.
09.03 Allocate efficient use of site space.
09.04 Maintain clean and orderly construction site.
09.05 Store materials and equipment.
09.06 Describe units of work measurement.
09.07 Coordinate and control use of construction tools and equipment.
09.08 Prepare progress billing.
09.09 Store chemicals and paints.
09.10 Prepare work schedules.
09.11 Prepare material delivery schedules.
09.12 Expedite delivery of manufactured materials.
09.13 Analyze productivity.
09.14 Prepare sub-trades schedules.
09.15 Prepare and code daily costs.
09.16 Record deficiencies as a result of project inspections.
09.17 Prepare coded cost break downs.

09.18 Take appropriate action to correct project deficiencies.
09.19 Interpret computer output.
09.20 Prepare cash flow schedules.
09.21 Prepare schedules for computer input.
09.22 Develop and maintain coded cost system.
09.23 Prepare critical path schedule.
09.24 Monitor schedule to control project.

10.0 PERFORM TESTS AND INSPECTIONS — The student will be able to:

10.01 Conduct concrete impact hammer test.
10.02 Conduct concrete slump test.
10.03 Conduct concrete air content test.
10.04 Conduct sieve and hydrometer analysis test.
10.05 Conduct concrete unit weight test.
10.06 Conduct unit weight of aggregate test.
10.07 Calculate fineness modules.
10.08 Conduct lumber moisture content test.
10.09 Conduct liquid and plastics limits tests.
10.10 Check concrete placing and consolidation procedures.
10.11 Conduct moisture content test or soil.
10.12 Check form work.
10.13 Conduct moisture density test.
10.14 Calculate percentage of compaction.
10.15 Conduct density of material in place tests.
10.16 Sample, make, cure, and test concrete compressive strength specimen.
10.17 Conduct chemical analysis of water.
10.18 Check reinforcing steel and placing.
10.19 Inspect placing of fill and compaction procedures.
10.20 Conduct compressive strength test on concrete blocks.
10.21 Conduct roofing test.
10.22 Make mortar cubes and perform compressive strength test.
10.23 Conduct soundness test.
10.24 Conduct specific gravity tests.
10.25 Sample, make, cure and test flexual strength specimen.
10.26 Prepare Marshall test specimens.
10.27 Conduct unconfined compression test.
10.28 Conduct density test of Marshall test specimens.
10.29 Calcuate air voids and V.M.A. values.
10.30 Calculate bitumen extraction test.
10.31 Conduct C.B.R. test.
10.32 Conduct California sand equivalent test.
10.33 Conduct Rice specific gravity tests.
10.34 Conduct Marshall stability and flow tests.
10.35 Check asphalt mixing plant.
10.36 Conduct abrasion test.
10.37 Conduct peremeability test.
10.38 Conduct triaxial compression test.

11.0 SELECT, TRAIN, AND SUPERVISE PERSONNEL — The student will be able to:

11.01 Apply first aid.
11.02 Instruct new employee on company safety regulations.
11.03 Interpret basic company policies.
11.04 Select and hire employees.
11.05 Interview and evaluate perspective employees.
11.06 Evaluate employees' performance.
11.07 Write job description.
11.08 Evaluate employee grievance.
11.09 Interpret labor contracts.

12.0 DEMONSTRATE EFFICIENT OFFICE AND ADMINISTRATIVE PROCEDURES — The student will be able to:

12.01 Organize work area.
12.02 Select and use appropriate forms.
12.03 Develop and maintain filing system.
12.04 Maintain inventory of physical assets.
12.05 Set up and maintain technical reference library.
12.06 Maintain a system for field work authorizations.
12.07 Maintain a system for control and processing contract changes.

12.08 Maintain a system for back charges.
12.09 Interpret basic company accounting procedures.

13.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS — The student will be able to:

13.01 List sources of job openings other than public or private employment agencies.
13.02 Write a letter of application for a job.
13.03 Prepare a vita, resume, or personal fact sheet.
13.04 List factors to consider when applying for a job.
13.05 List ways of making contact with employers.
13.06 Identify documents which may be required when applying for a job interview.
13.07 Complete a job application form correctly.
13.08 Identify appropriate dress and grooming for a job interview.
13.09 Classify behaviors considered appropriate or inappropriate in a job interview situation.
13.10 Describe advantages to employer and employees of being a productive worker.
13.11 Explain the purpose of supervision, self discipline, and performance evaluation.
13.12 Identify appropriate response(s) to criticism from employer, supervisor, or other employees.
13.13 List consequences of being absent frequently from the job.
13.14 List consequences of frequently arriving late for work.
13.15 List factors to consider when resigning from a job.
13.16 Write a letter of resignation.

CURRICULUM FRAMEWORK		PROGRAM AREA:	Industrial
FLORIDA DEPARTMENT OF EDUCATION		EFFECTIVE DATE:	July, 1987

PROGRAM TITLE: Building Maintenance

CODE NUMBER: Secondary 8721300 Postsecondary ______

Florida CIP IN46.040100

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 10-12, 21

CERTIFICATION COVERAGE: BLDG MAINT 7 BLDG CONST @ 7

I. MAJOR CONCEPTS/CONTENT--The purpose of this program is to prepare students for employment as building maintainence repairers (899.381.010), carpenter helpers (860.381-022), plumbing assembler-installers (862.684-026) electrician helpers (824.261-010), painters (840.381.010, mason helpers (842.381-014), building cleaners (891.684-022), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, use of blueprints and schematics, basic carpentry repairs and maintenance, basic electrical system fault diagnosis and repair, basic plumbing system repairs and maintenance basic masonry repairs and maintenance, maintenance of air conditioning and heating systems, application of finishes, cleaning of building surfaces, recordkeeping, use and care of hand tools, power tools, and equipment and use of current industry standards, practices and techniques.

Listed below are the courses that comprise this program when offered at the secondary level:

8721310	Building Maintenance 1
8721320	Building Maintenance 2
8721330	Building Maintenance 3
8721340	Building Maintenance 4
8721350	Building Maintenance 5
8721360	Building Maintenance 6

II. LABORATORY ACTIVITIES: Laboratory activities are an integral part of this program and should include activities in carpentry, plumbing, masonry, air conditioning, application of finishes, cleaning structural surfaces and use and care of hand tools and equipment.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction is appropriate for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job in-school learning experiences; a work station which reflects equipment, skills, and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the students' individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program the student student will be able to:

01. Demonstrate basic maintenance fundamentals.
02. Demonstrate ability to read plans and drawings.
03. Demonstrate proficiency using basic hand tools.
04. Demonstrate proficiency using power tools.
05. Repair interior floors, walls, & ceilings.
06. Perform repairs on doors, windows, and screens.
07. Repair and replace cabinets.
08. Apply finishes to properly prepared surfaces.
09. Identify wood construction components.
10. Repair roofs.
11. Repair exterior masonry surfaces.
12. Perform plumbing system repairs and maintenance.
13. Perform electrical system fault diagnosis and repair.
14. Demonstrate and practice employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education
SECONDARY NUMBER: 8721300

PROGRAM TITLE: Building Maintenance
POSTSECONDARY NUMBER: ______

01.0 DEMONSTRATE BASIC MAINTENANCE FUNDAMENTALS--The student will be able to:

01.01 Comply with safety rules & practices.
01.02 Make job-related decimal & fraction calculations.
01.03 Solve job-related problems by adding, subtracting, multiplying, & dividing numbers.
01.04 Change numbers to percents.
01.05 Solve job-related problems operating a hand-held calculator.
01.06 Use ruler and tape measure to determine measurements.
01.07 Compute feet, inches, and yards.
01.08 Change hours and minutes to decimals, fractions, and mixed numbers.
01.09 Find inside and outside diameters of a pipe.
01.10 Find the time charged for labor of a job.

02.0 DEMONSTRATE ABILITY TO READ PLANS AND DRAWINGS--The student will be able to:

02.01 Identify dimensions.
02.02 Identify construction views, floor plans, and elevations.
02.03 Identify interior details.
02.04 Identify wiring details.
02.05 Identify use of the architects scale.
02.06 Identify electrical wiring symbols.
02.07 Identify lists of materials and specifications.
02.08 Identify section views.
02.09 Identify plumbing symbols used in blueprints.
02.10 Identify fitting symbols used in blueprints.

03.0 DEMONSTRATE PROFICIENCY USING BASIC HAND TOOLS--The student will be able to:

03.01 Use claw hammer to drive and pull out nails.
03.02 Use hand saws to cut boards.
03.03 Use screwdrivers to drive in screws.
03.04 Drill holes with hand powered drills.
03.05 Identify types and describe use of wrenches.
03.06 Identify types and describe use of pipe wrenches and plumbing tools.
03.07 Identify types and describe proper use of chisels.
03.08 Identify types and describe proper use of a staple gun.
03.09 Identify types and describe proper use of a wood plane.
03.10 Identify types and describe proper use of woodworking files.
03.11 Identify types and describe proper use of the spirit level.
03.12 Identify types and describe proper use of a socket wrench set.
03.13 Identify types and describe proper use of a hand or block sander.
03.14 Identify types and describe uses of carpenters squares and levels.

04.0 DEMONSTRATE PROFICIENCY USING POWER TOOLS--The student will be able to:

04.01 Set up, use and maintain portable power orbital sander, belt sander, and finish sander.
04.02 Set up, use and maintain portable drill and power screwdriver.
04.03 Set up, use and maintain handheld circular saw, reciprocating saw.
04.04 Set up, use and maintain a radial arm saw.
04.05 Set up, use and maintain a table saw.
04.06 Set up, use and maintain a drill press.
04.07 Set up, use and maintain a band saw.
04.08 Set up, use and maintain a power plane.

5.0 REPAIR INTERIOR FLOORS, WALLS, & CEILINGS--The student will be able to:

05.01 Repair a hole in dry wall.
05.02 Install paneling.
05.03 Install dry wall.
05.04 Check and repair fabric wall covering.
05.05 Replace broken floor tile.
05.06 Install Interior Trim.
05.07 Measure size of room.
05.08 Replace ceramic tile.
05.09 Describe the processes to shampoo carpets.

06.0 PERFORM REPAIRS ON DOORS, WINDOWS, AND SCREENS--The student will be able to:

06.01 Install a prehung door and casing.
06.02 Install door hardware.
06.03 Replace doors.
06.04 Check and replace hinges on doors.
06.05 Check and replace door closers.
06.06 Remove, measure and replace glass in wood frame window.
06.07 Remove, measure and replace glass in metal frame window.
06.08 Replace screen on wood screen frame.
06.09 Replace screen on metal screen frame.
06.10 Check and repair window glaze seal.
06.11 Replace sash locks in wooden windows.
06.12 Inspect and replace metal window operators and locks.

07.0 REPAIR AND REPLACE CABINETS--The student will be able to:

07.01 Identify parts of a cabinet.
07.02 Identify types of cabinet door installation.
07.03 Identify types of cabinet hardware.
07.04 Install cabinet hardware.
07.05 Describe cabinet installation procedures.

08.0 APPLY FINISHES TO PROPERLY PREPARED SURFACES--The student will be able to:

08.01 Erect an extension ladder for working at a height of 12 feet.
08.02 Erect a scaffold to work at a height of 12 feet.
08.03 Paint a surface with a roller, brush, and sprayer.
08.04 Prepare, seal, and stain new wood.
08.05 Apply coat of clear finish to stained wood.

09.0 IDENTIFY WOOD CONSTRUCTION COMPONENTS--The student will be able to:

09.01 Identify components of interior walls.
09.02 Identify components of exterior walls.
09.03 Identify components of roofs.
09.04 Identify components of flooring systems.

10.0 REPAIR ROOFS--The student will be able to:

10.01 Check and repair asphalt shingles.
10.02 Check and repair roof gutters and downspouts.
10.03 Seal pipes and vents on roofs.
10.04 Check and repair sheetmetal roofs.

11.0 REPAIR EXTERIOR MASONRY SURFACES--The student will be able to:

11.01 Identify the tools and equipment used for mixing mortar.
11.02 List the factors affecting consistency of mortar.
11.03 List common ratios of mortar mixtures.

11.04 Mix tuck-pointing mortar.
11.05 Apply mortar for brickwork.
11.06 Identify methods of putting up the line.
11.07 Identify type of trowels.
11.08 Apply mortar for block work.
11.09 List reasons for cleaning.
11.10 Identify cleaning equipment.
11.11 List types of cleaning material.
11.12 List reasons for caulking.
11.13 Match types of caulking to specific uses.
11.14 Replace caulking in expansion joints.
11.15 List safety precautions to follow when cleaning.
11.16 Identify methods of wall cleaning.

12.0 PERFORM PLUMBING SYSTEM REPAIRS AND MAINTENANCE--The student will be able to:

12.01 Replace fixtures and hardware.
12.02 Replace a lavatory.
12.03 Describe procedures to replace bathtubs and showers.
12.04 Replace kitchen sinks.
12.05 Install garbage disposals.
12.06 Repair or replace water closet components.
12.07 Replace traps.
12.08 Repair leaks in faucets.
12.09 Replace hot water heater tanks.
12.10 Replace or repair fixture water-supply pipes.
12.11 Reseal toilets to flanges.
12.12 Test and inspect repaired systems.
12.13 Cut metal pipe with a one-wheel steel pipe cutter.
12.14 Join plastic pipe to steel pipe.
12.15 Thread steel pipe with a non-adjustable diestock.
12.16 Cut copper tubing or pipe with a hacksaw.
12.17 Cut copper tubing or pipe with a tubing cutter.
12.18 Bend copper tubing or pipe with a spring bender.
12.19 Join copper tubing or pipe to copper tubing or pipe.
12.20 Join copper tubing to brass pipe fittings.
12.21 Join copper tubing to steel pipe.
12.22 Join copper tubing or pipe to plastic pipe.
12.23 Clean a drain and vent system with a manual snake or tape.

13.0 PERFORM ELECTRICAL SYSTEM FAULT DIAGNOSIS AND REPAIR--The student will be able to:

13.01 Replace duplex wall outlet.
13.02 Replace single pole light switch.
13.03 Replace a light and ballot in a fluorescent system.
13.04 Replace a faulty breaker.
13.05 Use a meter to determine continuity in an electrical distributor system.
13.06 De-energize a circuit for repairs.
13.07 Trace electrical circuits.
13.08 Replace a ballast in a flourescent system.
13.09 Check a heating-cooling thermostat.
13.10 Use a voltage tester.
13.11 Read resistance with an ohmmeter.
13.12 Service air filters.
13.13 Identify types of conduit.
13.14 Describe functions of a basic refrigeration system.
13.15 Replace a thermostat for a split system.

14.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents that may be required when applying for a job.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.

14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education
COURSE CREDIT: 1
PROGRAM TITLE: Building Maintenance
PROGRAM NUMBER: 8721300
COURSE TITLE: Building Maintenance 1
COURSE NUMBER: 8721310

COURSE DESCRIPTION:

This course is designed to provide instruction in basic math and safety, blueprint reading and use of basic hand tools.

01.0 DEMONSTRATE BASIC MAINTENANCE FUNDAMENTALS--The student will be able to:

01.01 Comply with safety rules & practices.
01.02 Make job-related decimal & fraction calculations.
01.03 Solve job-related problems by adding, subtracting, multiplying, & dividing numbers.
01.04 Change numbers to percents.
01.05 Solve job-related problems operating a hand-held calculator.
01.06 Use ruler and tape measure to determine measurements.
01.07 Compute feet, inches, and yards.
01.08 Change hours and minutes to decimals, fractions, and mixed numbers.
01.09 Find inside and outside diameters of a pipe.
01.10 Find the time charged for labor of a job.

02.0 DEMONSTRATE ABILITY TO READ PLANS AND DRAWINGS--The student will be able to:

02.01 Identify dimensions.
02.02 Identify construction views, floor plans, and elevations.
02.03 Identify interior details.
02.04 Identify wiring details.
02.05 Identify use of the architects scale.
02.06 Identify electrical wiring symbols.
02.07 Identify lists of materials and specifications.
02.08 Identify section views.
02.09 Identify plumbing symbols used in blueprints.
02.10 Identify fitting symbols used in blueprints.

03.0 DEMONSTRATE PROFICIENCY USING BASIC HAND TOOLS--The student will be able to:

03.01 Use claw hammer to drive and pull out nails.
03.02 Use hand saws to cut boards.
03.03 Use screwdrivers to drive in screws.
03.04 Drill holes with hand powered drills.
03.05 Identify types and describe use of wrenches.
03.06 Identify types and describe use of pipe wrenches and plumbing tools.
03.07 Identify types and describe proper use of chisels.
03.08 Identify types and describe proper use of a staple gun.
03.09 Identify types and describe proper use of a wood plane.
03.10 Identify types and describe proper use of woodworking files.
03.11 Identify types and describe proper use of the spirit level.
03.12 Identify types and describe proper use of a socket wrench set.
03.13 Identify types and describe proper use of a hand or block sander.
03.14 Identify types and describe uses of carpenters squares and levels.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education
COURSE CREDIT: 2
PROGRAM TITLE: Building Maintenance
PROGRAM NUMBER: 8721300
COURSE TITLE: Building Maintenance 2
COURSE NUMBER: 8721320

COURSE DESCRIPTION:

This course is designed to provide instruction in the use of power tools and repair of interior floors, walls, and ceilings.

04.0 DEMONSTRATE PROFICIENCY USING POWER TOOLS--The student will be able to:

04.01 Set up, use and maintain portable power orbital sander, belt sander, and finish sander.
04.02 Set up, use and maintain portable drill and power screwdriver.
04.03 Set up, use and maintain handheld circular saw, reciprocating saw.
04.04 Set up, use and maintain a radial arm saw.
04.05 Set up, use and maintain a table saw.
04.06 Set up, use and maintain a drill press.
04.07 Set up, use and maintain a band saw.
04.08 Set up, use and maintain a power plane.

5.0 REPAIR INTERIOR FLOORS, WALLS, & CEILINGS--The student will be able to:

05.01 Repair a hole in dry wall.
05.02 Install paneling.
05.03 Install dry wall.
05.04 Check and repair fabric wall covering.
05.05 Replace broken floor tile.
05.06 Install Interior Trim.
05.07 Measure size of room.
05.08 Replace ceramic tile.
05.09 Describe the processes to shampoo carpets.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education
COURSE CREDIT: 3
PROGRAM TITLE: Building Maintenance
PROGRAM NUMBER: 8721300
COURSE TITLE: Building Maintenance 3
COURSE NUMBER: 8721330

COURSE DESCRIPTION:

This course is designed to provide instruction for performing repairs on doors, windows, and screens, and in repairing and replacing cabinets.

06.0 PERFORM REPAIRS ON DOORS, WINDOWS, AND SCREENS--The student will be able to:

06.01 Install a prehung door and casing.
06.02 Install door hardware.
06.03 Replace doors.
06.04 Check and replace hinges on doors.
06.05 Check and replace door closers.
06.06 Remove, measure and replace glass in wood frame window.
06.07 Remove, measure and replace glass in metal frame window.
06.08 Replace screen on wood screen frame.
06.09 Replace screen on metal screen frame.
06.10 Check and repair window glaze seal.
06.11 Replace sash locks in wooden windows.
06.12 Inspect and replace metal window operators and locks.

07.0 REPAIR AND REPLACE CABINETS--The student will be able to:

07.01 Identify parts of a cabinet.
07.02 Identify types of cabinet door installation.
07.03 Identify types of cabinet hardware.
07.04 Install cabinet hardware.
07.05 Describe cabinet installation procedures.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education
COURSE CREDIT: 4

PROGRAM TITLE: Building Maintenance
PROGRAM NUMBER: 8721300

COURSE TITLE: Building Maintenance 4
COURSE NUMBER: 8721340

COURSE DESCRIPTION:

This course is designed to provide instruction in applying finishes to properly prepared surfaces and identify wood construction components.

08.0 APPLY FINISHES TO PROPERLY PREPARED SURFACES--The student will be able to:

08.01 Erect an extension ladder for working at a height of 12 feet.
08.02 Erect a scaffold to work at a height of 12 feet.
08.03 Paint a surface with a roller, brush, and sprayer.
08.04 Prepare, seal, and stain new wood.
08.05 Apply coat of clear finish to stained wood.

09.0 IDENTIFY WOOD CONSTRUCTION COMPONENTS--The student will be able to:

09.01 Identify components of interior walls.
09.02 Identify components of exterior walls.
09.03 Identify components of roofs.
09.04 Identify components of flooring systems.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education
COURSE CREDIT: 5

PROGRAM TITLE: Building Maintenance
PROGRAM NUMBER: 8721300

COURSE TITLE: Building Maintenance 5
COURSE NUMBER: 8721350

COURSE DESCRIPTION:

This course is designed to provide instruction in repairing roofs and exterior masonry surfaces and in performing plumbing system repairs and maintenance.

10.0 REPAIR ROOFS--The student will be able to:

10.01 Check and repair asphalt shingles.
10.02 Check and repair roof gutters and downspouts.
10.03 Seal pipes and vents on roofs.
10.04 Check and repair sheetmetal roofs.

11.0 REPAIR EXTERIOR MASONRY SURFACES--The student will be able to:

11.01 Identify the tools and equipment used for mixing mortar.
11.02 List the factors affecting consistency of mortar.
11.03 List common ratios of mortar mixtures.
11.04 Mix tuck-pointing mortar.
11.05 Apply mortar for brickwork.

11.06 Identify methods of putting up the line.
11.07 Identify type of trowels.
11.08 Apply mortar for block work.
11.09 List reasons for cleaning.
11.10 Identify cleaning equipment.
11.11 List types of cleaning material.
11.12 List reasons for caulking.
11.13 Match types of caulking to specific uses.
11.14 Replace caulking in expansion joints.
11.15 List safety precautions to follow when cleaning.
11.16 Identify methods of wall cleaning.

12.0 PERFORM PLUMBING SYSTEM REPAIRS AND MAINTENANCE--The student will be able to:

12.01 Replace fixtures and hardware.
12.02 Replace a lavatory.
12.03 Describe procedures to replace bathtubs and showers.
12.04 Replace kitchen sinks.
12.05 Install garbage disposals.
12.06 Repair or replace water closet components.
12.07 Replace traps.
12.08 Repair leaks in faucets.
12.09 Replace hot water heater tanks.
12.10 Replace or repair fixture water-supply pipes.
12.11 Reseal toilets to flanges.
12.12 Test and inspect repaired systems.
12.13 Cut metal pipe with a one-wheel steel pipe cutter.
12.14 Join plastic pipe to steel pipe.
12.15 Thread steel pipe with a non-adjustable diestock.
12.16 Cut copper tubing or pipe with a hacksaw.
12.17 Cut copper tubing or pipe with a tubing cutter.
12.18 Bend copper tubing or pipe with a spring bender.
12.19 Join copper tubing or pipe to copper tubing or pipe.
12.20 Join copper tubing to brass pipe fittings.
12.21 Join copper tubing to steel pipe.
12.22 Join copper tubing or pipe to plastic pipe.
12.23 Clean a drain and vent system with a manual snake or tape.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education COURSE CREDIT: 6

PROGRAM TITLE: Building Maintenance PROGRAM NUMBER: 8721300

COURSE TITLE: Building Maintenance 6 COURSE NUMBER: 8721360

COURSE DESCRIPTION:

This course is designed to provide instruction in performing electrical system fault diagnosis and repair and in demonstrating employability skills and entrepreneurship understanding.

13.0 PERFORM ELECTRICAL SYSTEM FAULT DIAGNOSIS AND REPAIR--The student will be able to:

13.01 Replace duplex wall outlet.
13.02 Replace single pole light switch.
13.03 Replace a light and ballot in a fluorescent system.
13.04 Replace a faulty breaker.
13.05 Use a meter to determine continuity in an electrical distributor system.
13.06 De-energize a circuit for repairs.
13.07 Trace electrical circuits.
13.08 Replace a ballast in a flourescent system.
13.09 Check a heating-cooling thermostat.
13.10 Use a voltage tester.
13.11 Read resistance with an ohmmeter.
13.12 Service air filters.

13.13 Identify types of conduit.
13.14 Describe functions of a basic refrigeration system.
13.15 Replace a thermostat for a split system.

14.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents that may be required when applying for a job.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Building Maintenance and Engineering

CODE NUMBER--Secondary ____________ Postsecondary BCT0771

Florida CIP IN46.042100

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS _________

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

_____ Postsecondary Vocational x Other 13-17

CERTIFICATION COVERAGE: BLDG MAINT 7 BLDG CONST @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as building maintainence repairers (899.381.010), carpenter helpers (860.381-022), plumbing assembler-installers (862.684-026), electrician helpers (824.261-010), painters (840.381-010), mason helpers (842.381-014), building cleaners (891.684-022), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, use of blueprints and schematics, basic carpentry repairs and maintenance, basic electrical system fault diagnosis and repair, basic plumbing system repairs and maintenance basic masonry repairs and maintenance, maintenance of air conditioning and heating systems, application of finishes, cleaning of building surfaces, recordkeeping, use and care of hand tools, power tools, and equipment and use of current industry standards, practices and techniques.

II. LABORATORY ACTIVITIES: Laboratory activities are an integral part of this program and should include activities in carpentry, plumbing, masonry, air conditioning, application of finishes, cleaning structural surfaces and use and care of hand tools and equipment.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction is appropriate for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job in-school learning experiences; a work station which reflects equipment, skills, and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program the student will be able to:

01. Demonstrate basic maintenance fundamentals.
02. Demonstrate ability to read plans and drawings.
03. Demonstrate proficiency using basic hand tools.
04. Demonstrate proficiency using power tools.
05. Repair interior floors, walls, & ceilings.
06. Perform repairs on doors, windows, and screens.
07. Repair and replace cabinets.
08. Apply finishes to properly prepared surfaces.
09. Identify wood construction components.
10. Repair roofs.
11. Repair exterior masonry surfaces.
12. Perform plumbing system repairs and maintenance.
13. Perform electrical system fault diagnosis and repair.
14. Demonstrate and practice employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education — SECONDARY NUMBER: ________

PROGRAM TITLE: Building Maintenance and Engineering — POSTSECONDARY NUMBER: BCT0771

01.0 DEMONSTRATE BASIC MAINTENANCE FUNDAMENTALS--The student will be able to:

01.01 Comply with safety rules & practices.
01.02 Make job-related decimal & fraction calculations.
01.03 Solve job-related problems by adding, subtracting, multiplying, & dividing numbers.
01.04 Change numbers to percents.
01.05 Solve job-related problems operating a hand-held calculator.
01.06 Solve job-related problems using mathematical handbooks, charts, & tables.
01.07 Determine ratios and proportions.
01.08 Convert measurements from English to metric & from metric to English.
01.09 Use ruler and tape measure to determine measurements.
01.10 Compute feet, inches, and yards.
01.11 Change hours and minutes to decimals, fractions, and mixed numbers.
01.12 Find inside and outside diameters of a pipe.
01.13 Find the time charged for labor of a job.

02.0 DEMONSTRATE ABILITY TO READ PLANS AND DRAWINGS--The student will be able to:

02.01 Identify dimensions.
02.02 Identify construction views, floor plans, and elevations.
02.03 Identify interior details.
02.04 Identify wiring details.
02.05 Identify use of the architects scale.
02.06 Identify electrical wiring symbols.
02.07 Identify lists of materials and specifications.
02.08 Identify section views.
02.09 Identify plumbing symbols used in blueprints.
02.10 Identify fitting symbols used in blueprints.

03.0 DEMONSTRATE PROFICIENCY USING BASIC HAND TOOLS--The student will be able to:

03.01 Use claw hammer to drive and pull out nails.
03.02 Use hand saws to cut boards.
03.03 Use screwdrivers to drive in screws.
03.04 Drill holes with hand powered drills.
03.05 Identify types and describe use of wrenches.
03.06 Identify types and describe use of pipe wrenches and plumbing tools.
03.07 Identify types and describe proper use of chisels.
03.08 Identify types and describe proper use of a staple gun.
03.09 Identify types and describe proper use of a wood plane.
03.10 Identify types and describe proper use of woodworking files.
03.11 Identify types and describe proper use of the spirit level.
03.12 Identify types and describe proper use of a socket wrench set.
03.13 Identify types and describe proper use of a hand or block sander.
03.14 Identify types and describe uses of carpenters squares and levels.

04.0 DEMONSTRATE PROFICIENCY USING POWER TOOLS--The student will be able to:

04.01 Set up, use and maintain portable power orbital sander, belt sander, and finish sander.
04.02 Set up, use and maintain portable drill and power screwdriver.

04.03 Set up, use and maintain handheld circular saw, reciprocating saw.
04.04 Set up, use and maintain a radial arm saw.
04.05 Set up, use and maintain a table saw.
04.06 Set up, use and maintain a drill press.
04.07 Set up, use and maintain a band saw.
04.08 Set up, use and maintain a power plane.
04.09 Set up, use and maintain a laminate trimmer.
04.10 Set up, use and maintain an electric router.
04.11 Set up, use and maintain a motorized miter saw.

5.0 REPAIR INTERIOR FLOORS, WALLS, & CEILINGS--The student will be able to:

05.01 Repair a hole in dry wall.
05.02 Install paneling.
05.03 Install dry wall.
05.04 Check and repair fabric wall covering.
05.05 Replace broken floor tile.
05.06 Install Interior Trim.
05.07 Measure size of room.
05.08 Repair roll flooring.
05.09 Check and repair ceiling tiles
05.10 Replace ceramic tile.
05.11 Identify types of roll insulation.
05.12 Describe the processes to shampoo carpets.
05.13 Describe the process for repairing carpets.

06.0 PERFORM REPAIRS ON DOORS, WINDOWS, AND SCREENS--The student will be able to:

06.01 Install a prehung door and casing.
06.02 Install door hardware.
06.03 Replace doors.
06.04 Check and replace hinges on doors.
06.05 Check and replace door closers.
06.06 Check, repair, and install panic bars on doors.
06.07 Remove, measure and replace glass in wood frame window.
06.08 Remove, measure and replace glass in metal frame window.
06.09 Replace screen on wood screen frame.
06.10 Replace screen on metal screen frame.
06.11 Check and repair window glaze seal.
06.12 Repair a wooden window frame.
06.13 Replace sash locks in wooden windows.
06.14 Inspect and replace metal window operators and locks.

07.0 REPAIR AND REPLACE CABINETS--The student will be able to:

07.01 Identify parts of a cabinet.
07.02 Identify types of cabinet door installation.
07.03 Identify types of cabinet hardware.
07.04 Install cabinet hardware.
07.05 Describe cabinet installation procedures.
07.06 Install cabinet shelving.

08.0 APPLY FINISHES TO PROPERLY PREPARED SURFACES--The student will be able to:

08.01 Erect an extension ladder for working at a height of 12 feet.
08.02 Erect a scaffold to work at a height of 12 feet.
08.03 Paint a surface with a roller, brush, and sprayer.
08.04 Prepare, seal, and stain new wood.
08.05 Apply coat of clear finish to stained wood.

09.0 IDENTIFY WOOD CONSTRUCTION COMPONENTS--The student will be able to:

09.01 Identify components of interior walls.
09.02 Identify components of exterior walls.
09.03 Identify components of roofs.
09.04 Identify components of flooring systems.
09.05 Identify types of wall intersections.
09.06 Identify types of roof sheathing and describe installation procedures.
09.07 Identify types of wall sheathing and describe installation procedures.

09.08 Identify types of floor sheathing and describe installation procedures.
09.09 Identify main parts and types of trusses.
09.10 Identify pieces of hardware used in truss construction.
09.11 Describe types of wood splices.

10.0 REPAIR ROOFS--The student will be able to:

10.01 Check and repair asphalt shingles.
10.02 Check and repair wood shingles.
10.03 Check and repair built-up roofs.
10.04 Describe installation of roof flashing.
10.05 Check and repair roof gutters and downspouts.
10.06 Seal pipes and vents on roofs.
10.07 Check and repair sheetmetal roofs.

11.0 REPAIR EXTERIOR MASONRY SURFACES--The student will be able to:

11.01 Identify the tools and equipment used for mixing mortar.
11.02 List the factors affecting consistency of mortar.
11.03 List common ratios of mortar mixtures.
11.04 Mix types of mortar (M, N, S, & O) mechanically and by hand.
11.05 Mix tuck-pointing mortar.
11.06 Apply mortar for brickwork.
11.07 Identify methods of putting up the line.
11.08 Identify type of trowels.
11.09 Apply mortar for block work.
11.10 List reasons for cleaning.
11.11 Identify cleaning equipment.
11.12 List types of cleaning material.
11.13 Identify pointing tools.
11.14 Point new work.
11.15 Point old work.
11.16 List reasons for caulking.
11.17 Match types of caulking to specific uses.
11.18 Replace caulking in expansion joints.
11.19 List safety precautions to follow when cleaning.
11.20 Identify methods of wall cleaning.
11.21 Describe procedures for stucco repair.

12.0 PERFORM PLUMBING SYSTEM REPAIRS AND MAINTENANCE--The student will be able to:

12.01 Replace fixtures and hardware.
12.02 Replace a lavatory.
12.03 Describe procedures to replace bathtubs and showers.
12.04 Replace kitchen sinks.
12.05 Install garbage disposals.
12.06 Hook up ice makers.
12.07 Repair or replace water closet components.
12.08 Replace traps.
12.09 Repair leaks in faucets.
12.10 Replace hot water heater tanks.
12.11 Replace or repair fixture water-supply pipes.
12.12 Reseal toilets to flanges.
12.13 Test and inspect repaired systems.
12.14 Bend steel pipe with a heavy-duty bending tool.
12.15 Bend steel pipe with a chain vise and torch.

12.16 Cut metal pipe with a one-wheel steel pipe cutter.
12.17 Join plastic pipe to steel pipe.
12.18 Thread steel pipe with a non-adjustable diestock.
12.19 Cut copper tubing or pipe with a hacksaw.
12.20 Cut copper tubing or pipe with a tubing cutter.
12.21 Bend copper tubing or pipe with a spring bender.
12.22 Join copper tubing or pipe to copper tubing or pipe.
12.23 Join copper tubing to brass pipe fittings.
12.24 Join copper tubing to steel pipe.
12.25 Join copper tubing or pipe to plastic pipe.
12.26 Braze pipe with a gas torch and filler metal.
12.27 Clean a drain and vent system with a manual snake or tape.

13.0 PERFORM ELECTRICAL SYSTEM FAULT DIAGNOSIS AND REPAIR--The student will be able to:

13.01 Replace duplex wall outlet.
13.02 Replace single pole light switch.
13.03 Replace a light and ballot in a fluorescent system.
13.04 Replace a faulty breaker.
13.05 Use a meter to determine continuity in an electrical distributor system.
13.06 Rewire a lamp or appliance.
13.07 De-energize a circuit for repairs.
13.08 Trace electrical circuits.
13.09 Service belt drive blowers.
13.10 Replace a ballast in a flourescent system.
13.11 Check a heating-cooling thermostat.
13.12 Install exhaust fans.
13.13 Replace hot water heater unit component parts.
13.14 Wire a blower motor into an electrical supply.
13.15 Use a voltage tester.
13.16 Read resistance with an ohmmeter.
13.17 Service air filters.
13.18 Identify types of conduit.
13.19 Describe functions of a basic refrigeration system.
13.20 Replace a thermostat for a split system.
13.21 Change a drive belt in an air circulation system.
13.22 Check and recharge freon gas supply on small air conditioners.

14.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents that may be required when applying for a job.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Cabinet Making, Millwork, and Furniture Making

CODE NUMBER: Secondary ______ Postsecondary BCT0200

Florida CIP IN48.070300

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-17

CERTIFICATION COVERAGE: CAB WOODWK 7 CARPENTRY 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as cabinetmakers (50140400), wood machinists (61021404), cabinetmakers (660.280-010), wood patternmakers (661.281-022), wood model makers (661.380-010), furniture assemblers (763.684-038), furniture finishers (763.381-010), wood furniture repairers (769.684-038), woodworking inspectors (769.687-026) or cabinet and trim installers (806.684-018), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, planing, designing and construction of casework, fixtures, window and door frames, molding, trim, and furniture. Mass production methods and custom work are covered in this program.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provides instruction in the use of equipment including table saws, radial arm saws, jointers and planers, band saws, wood lathe, routers and shapers, belt sanders, drills and drill presses, portable power hand tools, and hand tools.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply safety rules and procedures.
02. Utilize hand tools.
03. Operate circular saws.
04. Operate saber saws.
05. Operate drills.
06. Operate power screwdrivers.
07. Operate power planes.

08. Operate routers.
09. Operate sanders.
10. Operate staplers and nailers.
11. Operate table saws.
12. Operate radial arm saws.
13. Operate drill and drill press.
14. Operate jointer and planers.
15. Operate band saws.
16. Operate router and shapers.
17. Operate power miter boxes.
18. Operate scroll saws.
19. Operate mortisers.
20. Operate tenoners.
21. Operate sanding machines.
22. Operate wood lathes.
23. Make curved pieces.
24. Plan, design, and layout casework.
25. Construct joints.
26. Fasten stock and joints.
27. Construct cabinets.
28. Construct drawers.
29. Construct cabinet doors.
30. Apply laminates.
31. Construct tables.
32. Finish surfaces.
33. Construct furniture.
34. Perform millwork operations.
35. Demonstrate employability skills.
36. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ____________

PROGRAM TITLE: Cabinet Making, Millwork, and Furniture Making POSTSECONDARY NUMBER: BCT0200

01.0 APPLY SAFETY RULES AND PROCEDURES--The student will be able to:

01.01 Apply shop safety rules and procedures.
01.02 Apply personal safety rules and procedures.
01.03 Apply fire safety rules and procedures.
01.04 Apply electrical safety rules and procedures.

02.0 UTILIZE HAND TOOLS--The student will be able to:

02.01 Layout 45 and 90 degree angles with squares.
02.02 Gauge lines parallel to an edge with finger, rule, and square.
02.03 Crosscut and rip to a layout line.
02.04 File crosscut and rip saws.
02.05 Build a miter box.
02.06 Cope molding.
02.07 Cut metal with a hacksaw.
02.08 Divide a distance into equal spaces using a divider.
02.09 Scribe and fit edges of stock to an irregular surface.
02.10 Sharpen bits and bore holes.
02.11 Drill, countersink, counterbore, and plug for screws.
02.12 Drive screws.
02.13 Drive and set nails.
02.14 Grind twist drills.
02.15 Sharpen and use chisels.
02.16 Sharpen, adjust and use planes.
02.17 Sharpen and use cabinet scrapers.

03.0 OPERATE A CIRCULAR SAW--The student will be able to:

03.01 Remove and replace blades and make adjustments.
03.02 Make straight cuts to layout lines.
03.03 Make bevel and compound angle cuts.
03.04 Make pocket cuts.

04.0 OPERATE A SABER SAW--The student will be able to:

04.01 Remove and replace blade and make adjustments.
04.02 Make cuts to curved layout lines.
04.03 Make bevel cuts.
04.04 Make pocket cuts.

05.0 OPERATE A DRILL--The student will be able to:

05.01 Remove and replace drills and bits.
05.02 Drill and bore holes through stock.
05.03 Drill and bore holes to specified depth.

06.0 OPERATE A POWER SCREWDRIVER--The student will be able to:

06.01 Remove and replace bits and make adjustments.
06.02 Drive screws.

07.0 OPERATE POWER PLANES--The student will be able to:

07.01 Remove and replace cutter and make adjustments.
07.02 Plane and square a straight edge.
07.03 Plane a beveled edge.

08.0 OPERATE A ROUTER--The student will be able to:

08.01 Remove, select and replace bits and make adjustments.
08.02 Shape edges.
08.03 Cut grooves, dadoes, and rabbets.
08.04 Make and use templates for routing.
08.05 Route freehand.

09.0 OPERATE A SANDER--The student will be able to:

09.01 Remove and replace abrasive and make adjustments.
09.02 Sand a surface with a finishing sander.
09.03 Sand a surface with a belt sander.

10.0 OPERATE STAPLERS AND NAILERS--The student will be able to:

10.01 Fasten material with hand stapler.
10.02 Fasten material with pneumatic stapler and/or nailer.
10.03 Fasten butt joint with pneumatic corrugated fastener tool.

11.0 OPERATE A TABLE SAW--The student will be able to:

11.01 Inspect and clean a table saw.
11.02 Remove and replace table saw blades.
11.03 Lay out and make a crosscut.
11.04 Lay out and make a rip cut.
11.05 Lay out and cut a miter.
11.06 Install dado head to predetermined size.
11.07 Lay out and cut a dado
11.08 Lay out and cut a groove.

12.0 OPERATE A RADIAL ARM SAW--The student will be able to:

12.01 Inspect and clean a radial arm saw.
12.02 Remove and replace radial arm saw blades.
12.03 Lay out and make a crosscut.
12.04 Crosscut duplicate lengths.
12.05 Lay out and make a rip cut
12.06 Lay out and cut a miter and compound miter.
12.07 Install dado head to predetermined size.
12.08 Lay out and cut a dado.
12.09 Lay out and cut a groove.

13.0 OPERATE A DRILL AND DRILL PRESS--The student will be able to:

13.01 Inspect and clean a drill and drill press.
13.02 Remove and replace cutting tool and adjust table and stops.
13.03 Drill and bore holes in stock.
13.04 Counterbore holes in stock.
13.05 Countersink holes in stock.
13.06 Bore holes at an angle.
13.07 Bore spaced holes.
13.08 Drill holes in round stock.
13.09 Drill dowel holes in miters.
13.10 Make plugs.

14.0 OPERATE A JOINTER AND PLANER--The student will be able to:

14.01 Inspect and clean a jointer.
14.02 Remove, replace, and adjust blades or knives.
14.03 Inspect and clean a planer.
14.04 Face rough stock.
14.05 Square edge faced stock to specification.
14.06 Bevel or chamfer stock to specification.
14.07 Plane stock to specified thickness.

15.0 OPERATE A BAND SAW--The student will be able to:

15.01 Inspect and clean a band saw.
15.02 Remove and replace a band saw blade and adjust guides.
15.03 Fold band saw blade for storage.
15.04 Lay out and make a straight cut.
15.05 Lay out and make a freehand cut.
15.06 Lay out and cut a rectangular opening.
15.07 Make beveled cuts.
15.08 Cut circles.
15.09 Make compound saw cuts.

16.0 OPERATE A ROUTER AND SHAPER--The student will be able to:

16.01 Inspect and clean a router.
16.02 Inspect and clean a shaper.
16.03 Remove and install cutting bits and adjust.
16.04 Route stock without a template.
16.05 Rout stock with a template.
16.06 Mold stock with a fence.
16.07 Mold stock with a miter gauge.
16.08 Shape stock with collars.

17.0 OPERATE A POWER MITER BOX--The student will be able to:

17.01 Remove and replace blade.
17.02 Crosscut to length.
17.03 Cut miters.

18.0 OPERATE A SCROLL SAW--The student will be able to:

18.01 Remove, select and replace blades.
18.02 Make external cuts.
18.03 Make internal cuts.

19.0 OPERATE A MORTISER--The student will be able to:

19.01 Remove and replace hollow chisel and bit and adjust.
19.02 Cut a mortise.
19.03 Adjust stops and cut identical mortises.

20.0 OPERATE A TENONER--The student will be able to:

20.01 Remove and replace cutting tools.
20.02 Cut a tenon with square shoulders.
20.03 Cut a tenon with offset square shoulders.
20.04 Cut a tenon with coped shoulders.
20.05 Cut tenons on both ends of identical lengths.

21.0 OPERATE SANDING MACHINES--The student will be able to:

21.01 Set up and use a belt sander to sand a surface.
21.02 Set up and use disc sander to sand a surface.
21.03 Set up and use spindle sander to sand surfaces.

22.0 OPERATE A WOOD --The student will be able to:

22.01 Sharpen turning tools.
22.02 Inspect and clean a wood lathe.
22.03 Mount and true stock.
22.04 Turn a straight cylinder to specified diameter.
22.05 Cut shoulders to round.
22.06 Cut a taper.
22.07 Cut a V-groove.
22.08 Cut a bead.
22.09 Cut a cove.
22.10 Sand turned stock.
22.11 Make a spindle turning of specified design.
22.12 Make duplicate spindle turnings.
22.13 Mount a faceplate turning stock.
22.14 Make a faceplate turning of specified design.
22.15 Make duplicate faceplate turnings.

23.0 MAKE AND LAMINATE CURVED PIECES--The student will be able to:

23.01 Make a curved piece by cutting from solid stock.
23.02 Make a curved piece by saw kerfing.
23.03 Make a curved piece by building up with curved segments.
23.04 Make a curved piece by laminating thin strips.

24.0 PLAN, DESIGN, AND LAYOUT CASEWORK--The student will be able to:

24.01 Make an elevation drawing of a job.
24.02 Make an orthographic drawing of a job.
24.03 Interpret blueprints and explain common abbreviations used on drawings.
24.04 Use arch scale rule.
24.05 Draw plans, sections and details.
24.06 Make a layout rod for a job.
24.07 Make a cutting list for a job.
24.08 Develop a plan of procedure for a job.
24.09 Make out work orders and billings.
24.10 Lay out a hexagon, octagon, and ellipse.
24.11 Lay out angles of various degrees.
24.12 Select and match woodstock for compatibility of grain and color.

25.0 CONSTRUCT JOINTS--The student will be able to:

25.01 Construct a butt joint.
25.02 Construct a doweled butt joint.
25.03 Construct a dado joint.
25.04 Construct a rabbeted joint.
25.05 Construct a lap joint.
25.06 Construct a miter joint.
25.07 Install dowels in common wood joints.
25.08 Construct a tongue-and-groove joint.
25.09 Construct a splined edge joint.
25.10 Construct a mortise-and-tenon joint.
25.11 Construct a dovetail joint.
25.12 Construct an end lap joint.
25.13 Construct a middle lap joint.
25.14 Construct a cross lap joint.
25.15 Construct a dovetail lap joint.

26.0 FASTEN STOCK AND JOINTS--The student will be able to:

26.01 Fasten stock with wood glue and parallel clamps.
26.02 Fasten stock and joints with nails.
26.03 Fasten stock and joints with staples.
26.04 Fasten stock and joints with screws.
26.05 Fasten stock and joints with bolts.
26.06 Fill and finish nail and screw holes.
26.07 Install wood plugs in prepared holes.
26.08 Conceal screw holes by counterboring and plugging.
26.09 Apply corner blocks with glue.
26.10 Glue and clamp stock edge to edge using bar and C clamps.
26.11 Band an edge by cluing and clamping with edging clamps.
26.12 Use spring clamps to clamp stock.
26.13 Glue and clamp a miter with miter clamps.
26.14 Fasten stock to walls using solid wall anchors.
26.15 Fasten stock to walls using hollow wall anchors.

27.0 CONSTRUCT CABINETS--The student will be able to:

27.01 Design, draw, lay out, and build a set of kitchen cabinets.
27.02 Install a set of kitchen cabinets.
27.03 Build a bathroom lavatory cabinet.

28.0 CONSTRUCT DRAWERS--The student will be able to:

28.01 Make an overlay drawer.
28.02 Make a lipped drawer.
28.03 Make a flush drawer.
28.04 Install wood and metal drawer guides.
28.05 Install drawer hardware.

29.0 CONSTRUCT CABINET DOORS--The student will be able to:

29.01 Make a solid door.
29.02 Make a tambour door.
29.03 Make a frame and panel door.
29.04 Cut and set glass in a frame.
29.05 Band edges of solid doors.
29.06 Hang overlay doors.
29.07 Hang lipped doors.
29.08 Fit and hang flush doors.
29.09 Install sliding doors.
29.10 Install door catches and pulls.

30.0 APPLY LAMINATES--The student will be able to:

30.01 Cut laminate to rough size.
30.02 Laminate a countertop.
30.03 Laminate a cabinet.
30.04 laminate a curved surface.

31.0 CONSTRUCT TABLES--The student will be able to:

- 31.01 Make a table with secure leg and rail construction.
- 31.02 Make a table with removable legs.
- 31.03 Make a trestle type table.
- 31.04 Make a drop leaf table.

32.0 FINISH SURFACES--The student will be able to:

- 32.01 Prepare a surface for finishing.
- 32.02 Bleach a surface.
- 32.03 Stain a surface.
- 32.04 Fill a surface.
- 32.05 Seal a surface.
- 32.06 Brush on a clean top coat.
- 32.07 Spray on a clear top coat.
- 32.08 Apply a pigmented finish.

33.0 CONSTRUCT FURNITURE--The student will be able to:

- 33.01 Design and draw a piece of fine furniture.
- 33.02 Lay out and build a piece of fine furniture.
- 33.03 Finish a piece of fine furniture.

34.0 PERFORM MILLWORK OPERATIONS--The student will be able to:

- 34.01 Make shaped moldings to specification.
- 34.02 Make a window screen.
- 34.03 Make a screen door.
- 34.04 Make a door frame.
- 34.05 Make an interior or exterior residential door.
- 34.06 Make a sash.
- 34.07 Make a window frame.
- 34.08 Make stairway parts.

35.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

- 35.01 Conduct a job search.
- 35.02 Secure information about a job.
- 35.03 Identify documents which may be required when applying for a job interview.
- 35.04 Complete a job application form correctly.
- 35.05 Demonstrate competence in job interview techniques.
- 35.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
- 35.07 Identify acceptable work habits.
- 35.08 Demonstrate knowledge of how to make job changes appropriately.
- 35.09 Demonstrate acceptable employee health habits.

36.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

- 36.01 Define entrepreneurship.
- 36.02 Describe the importance of entrepreneurship to the American economy.
- 36.03 List the advantages and disadvantages of business ownership.
- 36.04 Identify the risks involved in ownership of a business.
- 36.05 Identify the necessary personal characteristics of a successful entrepreneur.
- 36.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Chemical Technology

CODE NUMBER: Secondary ______ Postsecondary CHS0991

Florida CIP IN41.030100

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-15

CERTIFICATION COVERAGE: TEC CHEM 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as chemical engineering technicians (008.261-010), chemical laboratory technicians (022.261-010), scientific helpers (199.364-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and assists chemists and chemical engineers in conducting chemical and physical laboratory tests for various purposes such as manufacturing production, and the development of new products, materials, processing methods, and maintenance of health and safety standards.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in material handling, crushing, grinding, sizing, extraction, distillation, evaporation, drying, absorption, and heat transfer, as well as design, installation, and operation of chemical manufacturing processes.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 12.0, Language 12.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1620 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate laboratory safety procedures.
02. Demonstrate basic laboratory skills.
03. Set-up and operate laboratory equipment and instruments.
04. Perform basic laborabory calculations and measurements.
05. Provide maintenance of equipment and supplies.
06. Perform analysis procedures on food substances.

07. Perform air and water analysis procedures.
08. Read and interpret technical reports.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education

SECONDARY NUMBER: ______

PROGRAM TITLE: Chemical Technology

POSTSECONDARY NUMBER: CHS0991

01.0 DEMONSTRATE LABORATORY SAFETY PROCEDURES--The student will be able to:

01.01 Select safety supplies appropriate to task.
01.02 Operate safety equipment to provide personal and environmental safety.
01.03 Apply procedures to handle hazardous reagents, hot materials, sharp objects, and contaminating materials.
01.04 Utilize and identify appropriate safety clothing.

02.0 DEMONSTRATE BASIC LABORATORY SKILLS--The student will be able to:

02.01 Select appropriate glassware for task.
02.02 Weigh chemical reagents to prepare solutions or stains.
02.03 Mix chemicals to prepare reagents, solutions or stains.
02.04 Store prepared solutions and stains to maintain optimal condition.
02.05 Test solution with pH paper.
02.06 Determine percentage of alcohol reagents in a solution.
02.07 Filter substances to obtain residues.
02.08 Titrate solutions to obtain level of ph.

03.0 SET-UP AND OPERATE LABORATORY EQUIPMENT AND INSTRUMENTS--The student will be able to:

03.01 Operate pH meter.
03.02 Operate compound microscope.
03.03 Utilize oil immersion lens.
03.04 Operate Bunsen/Fisher burner safely.
03.05 Caliberate burette to prepare cure.
03.06 Operate balance scale.
03.07 Operate centrifuge.
03.08 Operate timing device.
03.09 Utilize autoclaves, hot air oven, and disinfectants.
03.10 Operate sound level measuring devices.
03.11 Operate a turbidimeter.
03.12 Operate gas chromatograph.
03.13 Operate technicon analyzer.

04.0 PERFORM BASIC LABORATORY CALCULATIONS AND MEASUREMENTS--The student will be able to:

04.01 Calculate quantities needed to perform a test analysis.
04.02 Measure volume of a solution to perform a laboratory test.
04.03 Measure length of an area in metrics.
04.04 Measure temperatures accurately.

05.0 PROVIDE MAINTENANCE OF EQUIPMENT AND SUPPLIES--The student will be able to:

05.01 Wash laboratory equipment appropriately.
05.02 Sterlize equipment to decontaminate soiled materials.
05.03 Inventory supplies and equipment.
05.04 Prepare equipment appropriately for tests.
05.05 Ensure optimal working condition of equipment and devices.

06.0 PERFORM ANALYSIS PROCEDURES ON FOOD SUBSTANCES--The student will be able to:

06.01 Describe the cultivation and growth of microorganisms.
06.02 Perform a standard plate count.
06.03 Examine microbiology.
06.04 Identify sources of contamination.
06.05 Perform a yeast and mold count.
06.06 Test food for disease.
06.07 Count bacteria using microscope.
06.08 Identify principles of food preparation.
06.09 Describe controlled atmosphere storage.
06.10 Perform heat sterilization techniques.

06.11 Evaluate containers.
06.12 Describe preparatory treatments for food.
06.13 Identify quality attributes.
06.14 Perform sediment test.
06.15 Evaluate pasteurization using phosphate test.
06.16 Define properties of sanitation of substances.

07.0 PERFORM AIR AND WATER ANALYSIS PROCEDURES--The student will be able to:

07.01 Describe characteristics of protists.
07.02 Determine emission rate using EPA methods.
07.03 Sample and analyze oxides in gases.
07.04 Describe pollution control practices.
07.05 Describe measurements of flow rates.
07.06 Analyze water using portable test kit.
07.07 Measure concentration of metals in water.
07.08 Perform toxicity test.
07.09 Determine oxygen demand and waste water out flows using standard methods.
07.10 Determine oil and grease concentration in wastewater outflow.
07.11 Describe characteristics of wastewater.
07.12 Apply federal pollution regulations.
07.13 Analyze properties of solids and liquids.

08.0 READ AND INTERPRET TECHNICAL REPORTS--The student will be able to:

08.01 Define chemical terms.
08.02 Identify chemical abbreviations.
08.03 Interpret chemical equations and specifications.
08.04 Analyze graphs and charts.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Civil/Structural Drafting

CODE NUMBER: Secondary ______ Postsecondary ETD0120

Florida CIP IN48.010300

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-17

CERTIFICATION COVERAGE: DRAFTING 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as structural drafters (005.281-014), civil drafters (005.281-010), blueprint machine operators (979.682-014), drafters, assistant (017.281-018), detailers (017.261-018), steel detailers (017.261-030), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, use of technical manuals and technical data; calculation of reactions and stresses; interpretation of codes and specifications; structural steel detailing, concrete reinforcing details, computer-aided drawings, and development of detailed construction drawings, topographical profiles, and specifications for use in planning and constructing highways, plants, and structures.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in drafting machines, office reproduction equipment, drafting tools, drafting tract, computer-assisted design systems, technical publications and reference materials, and drafting materials/supplies common to industry

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of orientation information.
02. Apply basic drafting skills.
03. Solve technical mathematical problems.
04. Prepare multi-view drawings.
05. Prepare sectional views.
06. Prepare auxiliary drawings.
07. Apply basic dimensioning.

08. Prepare pictorial drawings.
09. Prepare surface developments.
10. Utilize drafting applications.
11. Prepare basic charts and graphs.
12. Prepare basic computer-aided drawings.
13. Prepare basic architectural drawings.
14. Prepare basic structural details.
15. Prepare basic map drawings.
16. Prepare basic civil drawings.
17. Prepare basic electrical/electronic drawings.
18. Prepare basic pneumatic/hydraulic drawings.
19. Prepare computer-aided drawings.
20. Prepare structural steel drawings.
21. Prepare reinforced concrete drawings.
22. Prepare computer-aided drawings, two-dimensional and three-dimensional.
23. Demonstrate employability skills.
24. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education — SECONDARY NUMBER: ________
PROGRAM TITLE: Civil/Structural Drafting — POSTSECONDARY NUMBER: ETD0120

01.0 DEMONSTRATE KNOWLEDGE OF ORIENTATION INFORMATION--The student will be able to:

01.01 Identify school, classroom and grading policies.
01.02 Apply safety practices.
01.03 Identify drafting careers and occupational concepts.
01.04 Identify course overview.
01.05 Locate resource materials and audio-visual training equipment.
01.06 Use reproduction equipment i.e., blueprint machines and office copy equipment.

02.0 APPLY BASIC DRAFTING SKILLS--The student will be able to:

02.01 Use drafting equipment, measuring scales, drawing media, drafting instruments and consumable materials.
02.02 Use conversion tables for fractions, decimals and metric measurements.
02.03 Identify the use of the alphabet of lines.
02.04 Prepare title blocks and other drafting formats.
02.05 Use various freehand and other lettering techniques.
02.06 Apply geometric construction techniques.
02.07 Prepare axonometric, oblique and prospective sketches.
02.08 Interpret reports and specifications.

03.0 SOLVE TECHNICAL MATHEMATICAL PROBLEMS--The student will be able to:

03.01 Solve arithmetic problems.
03.02 Solve algebra problems.
03.03 Solve trigonometry problems.
03.04 Solve geometry problems.
03.05 Apply multiple discipline calculations.

04.0 PREPARE MULTI-VIEW DRAWINGS--The student will be able to:

04.01 Select proper drawing scale, views and layout.
04.02 Prepare drawings containing horizontal and vertical surfaces.
04.03 Prepare drawings containing circles and/or arcs.
04.04 Prepare drawing containing incline surface(s).
04.05 Prepare drawings incorporating partial views.
04.06 Prepare drawings incorporating removed details and conventional breaks.

05.0 PREPARE SECTIONAL VIEWS--The student will be able to:

05.01 Prepare drawings containing full sections and half sections.
05.02 Prepare drawings containing offset sections.
05.03 Prepare drawings containing revolved sections.
05.04 Prepare drawings containing removed sections and broken-out sections.
05.05 Use conventional representation.
05.06 Prepare a sectional-assembly drawing applying material symbols.

06.0 PREPARE AUXILIARY DRAWINGS--The student will be able to:

06.01 Prepare drawings containing primary auxiliary views.
06.02 Prepare drawings containing auxiliary views that include curved lines.
06.03 Prepare drawings containing auxiliary sections.
06.04 Prepare drawings containing secondary auxiliary views.

07.0 APPLY BASIC DIMENSIONING--The student will be able to:

07.01 Prepare drawings containing linear standard dimensions.
07.02 Prepare drawings that include angular standard dimensions.
07.03 Prepare drawings that include circular standard dimensions.
07.04 Prepare drawings using metric dimensions.
07.05 Prepare drawings using general and local notes.
07.06 Prepare drawings using surface characteristic notations.

08.0 PREPARE PICTORIAL DRAWINGS--The student will be able to:

08.01 Prepare isometric drawings.
08.02 Prepare dimetric drawings.
08.03 Prepare cavalier drawings.
08.04 Prepare cabinet drawings.
08.05 Prepare one and two point perspective.

09.0 PREPARE SURFACE DEVELOPMENTS--The student will be able to:

09.01 Prepare drawings with sketchouts of prisms, cylinders, cones and pyramids.
09.02 Prepare sketchouts of a transition piece(s).
09.03 Prepare drawing involving intersecting pieces.

10.0 UTILIZE DRAFTING APPLICATIONS--The student will be able to:

10.01 Identify and use the various drafting and graphic appliques.
10.02 Use cut and paste techniques.
10.03 Identify and use photo techniques.
10.04 Prepare overlay drawings.
10.05 Make drawing changes on a sepia.
10.06 Apply inking techniques.

11.0 PREPARE BASIC CHARTS AND GRAPHS--The student will be able to:

11.01 Prepare bar, pie, and flow charts.
11.02 Prepare rectangular and semi-logarithmic graphs.

12.0 PREPARE BASIC COMPUTER AIDED DRAWINGS--The student will be able to:

12.01 Use full size standard keyboard.
12.02 Use dual disc drive console.
12.03 Use monitor.
12.04 Use digitizer.
12.05 Use plotter (single and multipen).'
12.06 Format, transfer and operate diskette.
12.07 Produce multi-view drawings with dimensions.
12.08 Produce section view drawings with dimensions.
12.09 Produce auxiliary view drawings with dimensions.
12.10 Produce pictorial drawings.
12.11 Produce charts and graphs.

13.0 PREPARE BASIC ARCHITECTURAL DRAWINGS--The student will be able to:

13.01 Interpret vendors catalogs and technical tables.
13.02 Prepare floor plan drawings, with dimensions.
13.03 Prepare foundation plan and detail drawings, with dimensions.
13.04 Prepare elevation drawings with dimensions.
13.05 Prepare sections with dimensions.
13.06 Prepare schedules.
13.07 Prepare landscape layouts.

14.0 PREPARE BASIC STRUCTURAL DETAILS--The student will be able to:

14.01 Interpret structural steel and reinforcing concrete manuals and technical tables.
14.02 Draw structural steel beam connections.
14.03 Draw reinforcing bar details.

15.0 PREPARE BASIC MAP DRAWINGS--The student will be able to:

15.01 Prepare traverse drawings.
15.02 Prepare plat drawings.
15.03 Prepare street layout drawings.
15.04 Prepare map drawings.

16.0 PREPARE BASIC CIVIL DRAWINGS--The student will be able to:

16.01 Prepare topographic drawings.
16.02 Prepare drainage drawings.
16.03 Prepare highway drawings.

17.0 PREPARE BASIC ELECTRICAL/ELECTRONIC DRAWINGS--The student will be able to:

17.01 Prepare schematic drawings.
17.02 Prepare printed circuit board drawings.
17.03 Prepare package drawings.

18.0 PREPARE BASIC PNEUMATIC/HYDRAULIC DRAWINGS--The student will be able to:

18.01 Prepare piping drawings.
18.02 Prepare pictorial diagrams.
18.03 Prepare cutaway diagrams.
18.04 Prepare graphical diagrams.
18.05 Prepare combination diagrams.

19.0 PREPARE COMPUTER AIDED DRAWINGS--The student will be able to:

19.01 Produce architectural drawings.
19.02 Produce structural steel and reinforcing detail drawings.
19.03 Produce map drawings.
19.04 Produce civil drawings.
19.05 Produce electrical/electronic drawings.
19.06 Produce pneumatic/hydraulic drawings.

20.0 PREPARE STRUCTURAL STEEL DRAWINGS--The student will be able to:

20.01 Use the "Manual of Steel Construction" and other technical data.
20.02 Interpret codes and specifications.
20.03 Calculate reactions and stresses.
20.04 Prepare shear and moment diagrams.
20.05 Detail bolted connections.
20.06 Detail welded connections.
20.07 Prepare erection plans.
20.08 Assist in the preparation of bids.
20.09 Prepare advance bill for ordering materials.

21.0 PREPARE REINFORCED CONCRETE DRAWINGS--The student will be able to:

21.01 Use the "Manual of Standard Practice for Detailing Reinforced Concrete Structures" and other technical data.
21.02 Interpret codes and specifications.
21.03 Interpret engineering drawings.
21.04 Prepare column detail drawings.
21.05 Prepare footing and foundation drawings.
21.06 Prepare floor and roof detail drawings.
21.07 Prepare special structure detail drawings.
21.08 Prepare bar lists.

22.0 PREPARE COMPUTER AIDED DRAWINGS-TWO DIMENSIONAL AND THREE DIMENSIONAL--The student will be able to:

22.01 Produce shear and moment diagrams.
22.02 Produce bolted connection drawings.
22.03 Produce welding connection drawings.
22.04 Produce erection plan drawings.
22.05 Produce concrete footing and foundation drawings.
22.06 Produce concrete column detail drawings.
22.07 Produce concrete floor and roof detail drawings.
22.08 Produce bar lists.

23.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

23.01 Conduct a job search.
23.02 Secure information about a job.
23.03 Identify documents which may be required when applying for a job interview.
23.04 Complete a job application form correctly.
23.05 Demonstrate competence in job interview techniques.
23.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
23.07 Identify acceptable work habits.
23.08 Demonstrate knowledge of how to make job changes appropriately.
23.09 Demonstrate acceptable employee health habits.

24.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

24.01 Define entrepreneurship.
24.02 Describe the importance of entrepreneurship to the American economy.
24.03 List the advantages and disadvantages of business ownership.
24.04 Identify the risks involved in ownership of a business.
24.05 Identify the necessary personal characteristics of a successful entrepreneur.
24.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Commercial and Industrial Electricity

CODE NUMBER: Secondary ________________ Postsecondary ETI0810

Florida CIP IN47.019902

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ___________

APPLICABLE LEVELS(S): ____7-9 ____9-12 _____ Postsecondary Adult Vocational

____Postsecondary Vocational x Other 13-17

CERTIFICATION COVERAGE: ELECTRICAL 7 TEC ELEC @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as electricians, industrial (86.361-010) and electrician helpers, industrial (829.684-022), or to provide supplemental training for persons previously or currently employed in these occupations.

This program includes some of the competencies applicable to the common core of electronics program, and are identified by the designation (CE). The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and assembly, installation, operation, maintenance, and repair of electrical/electronic equipment used in industry and manufacturing.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in residential, commercial, and industrial wiring; servicing, maintaining, and using equipment, including lighting, conduit (raceway) systems, motors, and related equipment following the National Electrical Code, as well as hydraulic, pneumatic, and electronic controls and alarm systems.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communicatons, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student i 1800 contact hours (2160 clock hours).

IV. INTENDED OUTCOMES: After successfully completing this program, the individual will be able to:

01. Demonstrate proficiency in laboratory practices.
02. Demonstrate proficiency in DC circuits.

03. Demonstrate proficiency in AC circuits.
04. Demonstrate proficiency in electronic components and circuits.
05. Demonstrate Proficiencyin basic logic circuits.
06. Demonstrate industrial wiring skills
07. Install transformers
08. Operate AC and DC rotating equipment
09. Construct control circuits and install electrical controls and devices.
10. Repair motors
11. Demonstrate employability skills
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1986

PROGRAM AREA: Industrial Education
SECONDARY NUMBER: ____________

PROGRAM TITLE: Commercial and Industrial Electricity
POSTSECONDARY NUMBER: ETI0810

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES--The student will be able to:

01.01 Apply laboratory policies and procedures
01.02 Apply laboratory safety rules and procedures
01.03 Demonstrate the operation of laboratory safety devices
01.04 Demonstrate personal safety procedures
01.05 Demonstrate first aid/emergency treatment procedures
01.06 Apply fire safety rules and procedures
01.07 Apply electrical safety rules and procedures
01.08 Demonstrate procedures for disaster situations
01.09 Solve problems requiring addition, subtraction, multiplication and division of whole numbers
01.10 Solve problems requiring addition, subtraction, multiplication and division of common fractions
01.11 Solve problems requiring addition, subtraction, multiplication and division of decimal numbers
01.12 Convert decimals to fractions and fractions to decimals
01.13 Convert English measure to metric measure and metric measure to English measure
01.14 Solder and desolder components
01.15 Drill holes in metal or plastic chassis
01.16 Measure voltage in a simple circuit
01.17 Measure amperage in a simple circuit
01.18 Measure resistance in a simple circuit
01.19 Produce a voltage by chemical means
01.20 Produce a voltage by mechanical means
01.21 Produce a voltage by thermal means
01.22 Produce a voltage by photoelectric means
01.23 Identify physical and mechanical abilities of the electrical trade
01.24 Demonstrate use & care of ladders
01.25 Demonstrate use & care of tools
01.26 Demonstrate use of shovels & axes
01.27 Prepare a trench for conduit
01.28 Backfill and compact a conduit trench
01.29 Organize storage areas on site
01.30 Demonstrate service truck loading procedures
01.31 Perform daily maintenance on service trucks
01.32 Demonstrate rigging procedures using ropes, cables, and chains
01.33 Identify use of rigging hand signals for crane operators

02.0 DEMONSTRATE PROFICIENCY IN DC CIRCUITS--The student will be able to:

02.01 Solve basic algebraic problems as applicable to electricity/electronics (prerequisite to DC) (CE)
02.02 Relate electricity to the nature of matter (CE)
02.03 Identify sources of electricity (CE)
02.04 Define voltage, current, resistance, power, and energy (CE)
02.05 Apply and relate Ohm's Law (CE)
02.06 Measure properties of a circuit using VOM and DVM meters (CE)
02.07 Compute and measure conductance and resistance of conductors and insulators (CE)
02.08 Analyze series circuits (CE)
02.09 Construct series circuits (CE)
02.10 Troubleshoot series circuits (CE)
02.11 Draw a series circuit and calculate circuit values
02.12 Analyze parallel circuits (CE)
02.13 Construct parallel circuits (CE)
02.14 Troubleshoot parallel circuits (CE)
02.15 Draw a parallel circuit and calculate circuit values
02.16 Analyze series-parallel circuits (CE)
02.17 Construct series-parallel circuits (CE)
02.18 Troubleshoot series-parallel circuits (CE)
02.19 Draw a series-parallel circuit and calculate circuit values (CE)

02.20 Define magnetic properties of circuits and devices (CE)
02.21 Determine physical and electrical characteristics of capacitors and inductors (CE)
02.22 Analyze and measure RL and RC time constants (CE)
02.23 Set up and operate a VOM for DC circuits (CE)
02.24 Set up and operate a DVM for DC circuits (CE)
02.25 Set up and operate power supplies for DC circuits (CE)
02.26 Set up and operate oscilloscopes for DC circuits (CE)
02.27 Construct an electromagnet (CE)
02.28 Construct a simple DC generator (CE)
02.29 Construct a simple DC motor (CE)
02.30 Analyze filter circuits (CE)
02.31 Construct filter circuits (CE)
02.32 Troubleshoot filter circuits (CE)
02.33 Set up and operate frequency counters for DC circuits (CE)
02.34 Set up and operate signal generators for DC circuits (CE)
02.35 Set up and operate capacitor-inductor analyzers for DC circuits (CE)

03.0 DEMONSTRATE PROFICIENCY IN AC CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electricity/electronics (prerequisite to AC)
03.02 Identify properties of an AC signal
03.03 Identify AC sources
03.04 Analyze and measure AC signals using oscilloscope, frequency meters, and generators
03.05 Analyze AC capacitive circuits
03.06 Construct AC capacitive circuits
03.07 Troubleshoot AC capacitive circuits
03.08 Analyze AC inductive circuits
03.09 Construct AC inductive circuits
03.10 Troubleshoot AC inductive circuits
03.11 Analyze and apply principles of transformers to AC circuits
03.12 Analyze RLC circuits (series, parallel, complex)
03.13 Construct RLC circuits (series, parallel, complex)
03.14 Troubleshoot RLC circuits (series, parallel, complex)
03.15 Analyze series and parallel resonant circuits
03.16 Construct series and parallel resonant circuits
03.17 Troubleshoot series and parallel resonant circuits
03.18 Analyze polyphase circuits
03.19 Construct polyphase circuits
03.20 Troubleshoot polyphase circuits
03.21 Analyze basic motor theory and operation
03.22 Analyze basic generator theory and operation
03.23 Set up and operate a VOM for AC circuits
03.24 Set up and operate a DVM for AC circuits
03.25 Set up and operate power supplies for AC circuits
03.26 Set up and operate impedance bridges for AC circuits
03.27 Display and read waveforms
03.28 Insert a capacitor in series in an AC circuit
03.29 Develop a time constant curve
03.30 Insert inductors in series in an AC circuit
03.31 Construct a series RL circuit
03.32 Measure voltage across a resistor and an inductor at varying frequencies in a series RL circuit
03.33 Measure voltage across a resistor and an inductor at various values of resistance in a series RL circuit
03.34 Measure voltage across a resistor and an inductor at various values of inductance in a series RL circuit
03.35 Construct a parallel RL circuit
03.36 Measure current through a resistor and an inductor at varying frequencies in a parallel RL circuit
03.37 Measure current through a resistor and an inductor at various values of resistance in a parallel RL circuit
03.38 Measure current through a resistor and an inductor at various values of inductance in a parallel RL circuit
03.39 Construct a series RC circuit
03.40 Measure voltage across a resistor and a capacitor at varying frequencies in a series RC circuit
03.41 Measure voltage across a resistor and a capacitor at various values of resistance in a series RC circuit

03.42 Measure voltage across a resistor and a capacitor at various values of capacitance in a series RC circuit
03.43 Construct a parallel RC circuit
03.44 Measure current through a resistor and a capacitor at varying frequencies in a parallel RC circuit
03.45 Measure current through a resistor and a capacitor at various values of resistance in a parallel RC circuit
03.46 Measure current through a resistor and a capacitor at various values of capacitance in a parallel RC circuit
03.47 Construct a series RLC circuit
03.48 Measure voltage across a resistor, a capacitor, and an inductor at varying frequencies in a series RLC circuit
03.49 Measure voltage across a resistor, a capacitor, and an inductor at various values of resistance in a series RLC circuit
03.50 Measure voltage across a resistor, a capacitor, and an inductor at various values of capacitance in a series RLC circuit
03.51 Measure voltage across a resistor, a capacitor, and an inductor at various values of inductance in a series RLC circuit
03.52 Construct a parallel RLC circuit
03.53 Measure current through a resistor, a capacitor, and an inductor at varying frequencies in a parallel RLC circuit
03.54 Measure current through a resistor, a capacitor, and an inductor at various values of resistance in a parallel RLC circuit
03.55 Measure current through a resistor, a capacitor, and an inductor at various values of capacitance in a parallel RLC circuit
03.56 Measure current through a resistor, a capacitor, and an inductor at various values of inductance in a parallel RLC circuit
03.57 Read and interpret color codes to identify resistors
03.58 Analyze voltage dividers (loaded and unloaded)
03.59 Construct voltage dividers (loaded and unloaded)
03.60 Troubleshoot voltage dividers (loaded and unloaded)
03.61 Solve network theorem problems using Kirchoff, (V and I), Thevenin, Norton, Superposition, and Delta-Wye
03.62 Analyze maximum power transfer theory
03.63 Construct maximum power transfer theory
03.64 Troubleshoot maximum power transfer theory

04.0 DEMONSTRATE PROFICIENCY IN ELECTRONIC COMPONENTS AND CIRCUITS--The student will be able to:

04.01 Test semiconductor diodes
04.02 Test thyristors
04.03 Test bipolar transistors
04.04 Test unijunction transistors
04.05 Test circuit protection devices
04.06 Construct a half-wave low-voltage power supply circuit
04.07 Construct a full-wave low-voltage power supply circuit
04.08 Construct a full-wave low-voltage regulated power supply circuit
04.09 Construct a full-wave bridge-rectifier power supply circuit
04.10 Construct a UJT relaxation oscillator circuit

05.0 DEMONSTRATE PROFICIENCY IN BASIC LOGIC CIRCUITS--The student will be able to:

05.01 Convert decimal numbers to binary numbers
05.02 Convert decimal numbers to octal numbers
05.03 Solve problems using Boolean algebra
05.04 Construct an AND gate circuit
05.05 Construct an OR gate circuit
05.06 Construct an inverter circuit
05.07 Construct a NAND gate circuit
05.08 Construct a NOR gate circuit
05.09 Construct an exclusive OR gate circuit
05.10 Construct an RS and steered flip-flop
05.11 Construct a J-K flip-flop
05.12 Construct a logic counter circuit
05.13 Construct a logic addition and subtraction circuit
05.14 Construct a logic multiplication and division circuit
05.15 Construct a logic memory circuit

06.0 DEMONSTRATE INDUSTRIAL WIRING SKILLS--The student will be able to:

06.01 Obtain electrical wiring installation requirements from an industrial electrical plan/drawing
06.02 Draw an industrial electrical floor plan
06.03 Charge a lead-acid battery
06.04 Charge a nickle-cadmium battery
06.05 Repair an emergency lighting system
06.06 Correct the power factor on a system
06.07 Install a bus duct
06.08 Install bundled wiring in mounted lay-in duct work
06.09 Install circuit breakers in a panel board
06.10 Install a circuit using non-metallic sheathed cable
06.11 Install and connect system grounds
06.12 Install a distribution panel board
06.13 Install electrical metallic tubing
06.14 Install explosion-proof equipment
06.15 Install power and controls for A/C systems
06.16 Install a fluorescent lighting fixture
06.17 Install an incandescent lighting fixture
06.18 Install a lighting dimmer system
06.19 Install liquid-tight flexible metal conduit
06.20 Install multi-conductor cable
06.21 Install a multi-conduit layout
06.22 Install a multi-control lighting circuit
06.23 Install non-liquid-tight flexible metal conduit
06.24 Install plastic conduit
06.25 Install plug-in duct work
06.26 Install a power-feeder wiring system to machinery
06.27 Install a public address system
06.28 Install analog systems
06.29 Install digital communications cabling
06.30 Install fiber-optics communications cabling
06.31 Install rigid conduit
06.32 Install the service-entrance head for a service drop
06.33 Install underfloor duct work
06.34 Install an underground service entrance
06.35 Install and terminate high-voltage cable
06.36 Operate high-voltage test equipment
06.37 Use a megger (test kit) to test insulation
06.38 Prepare an equipment and material list
06.39 Complete an equipment and material order
06.40 Receive an equipment and material order

07.0 INSTALL TRANSFORMERS--The student will be able to:

07.01 Connect a single-phase step-down transformer
07.02 Connect a single-phase step-up transformer
07.03 Connect two single-phase transformers in parallel
07.04 Connect two single-phase transformers in an open-delta configuration
07.05 Connect a dual-voltage transformer (for high-voltage input and output)
07.06 Connect a dual-voltage transformer (for low-voltage input and output)
07.07 Connect an auto-transformer to give a variety of output voltages
07.08 Connect a single-phase distribution transformer to supply 115 and 230 volts
07.09 Connect a three-phase power transformer for a three-phase, four-wire connection
07.10 Connect a three-phase transformer for a three-phase, delta configuration
07.11 Connect a three-phase power transformer for a three-phase, wye configuration
07.12 Connect three single-phase transformers to form a delta-delta configuration
07.13 Connect three single-phase transformers to form a delta-star configuration
07.14 Connect three single-phase transformers to form a star-delta three-phase configuration
07.15 Connect three single-phase transformers to form a star-star, three-phase configuration

07.16 Install a current transformer and measure current flow
07.17 Install a potential transformer and measure voltage
07.18 Connect a booster transformer
07.19 Connect a bucking transformer

08.0 OPERATE AC AND DC ROTATING EQUIPMENT--The student will be able to:

08.01 Connect a DC shunt motor
08.02 Connect a DC series motor
08.03 Connect a DC compound motor
08.04 Connect a DC separately-excited shunt generator
08.05 Connect a DC self-excited shunt generator
08.06 Connect a DC compound generator
08.07 Connect a DC series generator
08.08 Connect a capacitor-start motor
08.09 Connect a split-phase induction motor
08.10 Connect a capacitor-run motor
08.11 Connect a universal motor
08.12 Connect a repulsion-start, induction-run motor
08.13 Connect a three-phase wound-rotor induction motor
08.14 Connect a three-phase squirrel-cage induction motor
08.15 Connect a three-phase synchronous motor
08.16 Connect a three-phase alternator

09.0 CONSTRUCT CONTROL CIRCUITS AND INSTALL ELECTRICAL CONTROLS AND DEVICES--The student will be able to:

09.01 Draw an elementary motor-control line diagram
09.02 Install a manual motor-control station
09.03 Install an automatic, push-button motor-control station
09.04 Install a three-phase-control magnetic starter
09.05 Install a two-station, push-button control station
09.06 Install a drum-switch control station
09.07 Install a control circuit to change the direction of rotation of a motor
09.08 Install a hands-off, automatic control circuit
09.09 Install a multiple push-button station
09.10 Install an interlocking/reversing control circuit
09.11 Install a hand-sequence control circuit
09.12 Install a timed-sequence control circuit
09.13 Install an automatic-sequence control circuit
09.14 Install an AC reduced-voltage starter (resistance)
09.15 Install a part-winding starter
09.16 Install a three-phase multispeed controller
09.17 Install a direct-current motor controller
09.18 Connect a pilot-motor-driven motor-timing control
09.19 Connect a capacitor timing starter
09.20 Install a jogging control circuit
09.21 Install a plugging control circuit
09.22 Install an electric breaking device
09.23 Install a direct-drive station
09.24 Install a gear-motor station
09.25 Construct a linear voltage regulator
09.26 Construct a switching voltage regulator
09.27 Construct an electronic wiring circuit
09.28 Construct a photoelectric relay circuit
09.29 Construct an operational amplifier circuit
09.30 Construct a transistor speed-control circuit
09.31 Construct a closed-loop speed-control circuit
09.32 Construct a pulse-width speed-control circuit
09.33 Construct a Triac speed-control circuit
09.34 Operate digital control systems for computer control systems
09.35 Install solid-state motor control systems
09.36 Install digital control systems (computer systems)
09.37 Construct a basic SCR speed-control circuit
09.38 Construct a pulse-triggered SCR speed-control circuit
09.39 Construct a closed-loop SCR speed-control circuit
09.40 Construct a tachometer-feedback speed-control circuit

10.0 REPAIR MOTORS--The student will be able to:

10.01 Disassemble and assemble a DC motor
10.02 Disassemble and assemble a single-phase motor
10.03 Disassemble and assemble a three-phase motor
10.04 Prepare a motor data card
10.05 Wind a DC motor
10.06 Wind a single-phase motor
10.07 Wind a three-phase motor
10.08 Install and connect a motor starting switch
10.09 Install a motor centrifugal mechanism
10.10 Install motor bearings and bushings
10.11 Troubleshoot and repair a DC motor
10.12 Troubleshoot and repair a single-phase motor
10.13 Troubleshoot and repair a three-phase motor

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search
11.02 Secure information about a job
11.03 Identify documents that may be required when applying for a job
11.04 Complete a job application form correctly
11.05 Demonstrate competence in job interview techniques
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
11.07 Identify acceptable work habits
11.08 Demonstrate knowledge of how to make job changes appropriately
11.09 Demonstrate acceptable employee health habits

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of s successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

NOTE: The competency statements ending with (CE) are the same as the commom core of electronics competencies.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Commercial Art

CODE NUMBER: Secondary ____ Postsecondary ARV0990

Florida CIP IN48.020300

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 13 - 17

CERTIFICATION COVERAGE: COMM ART 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as illustrators, (141.061-022), commercial designers (141.081-014), printmakers (144.061-014), airbrush artists (970.281-010), layout formers (970.381-018), letterers (970.661-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, basic art skills, lettering skills, preparation of layouts and illustrations, preparation of camera ready paste-up, and development of specialized skills.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in lettering signs, layout and design for advertising art, airbrush for illustrations, photo retouching, and custom work.

SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc. is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1290 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in communication skills.
02. Demonstrate proficiency in graphic production.
03. Demonstrate proficiency in technical art skills.
04. Demonstrate Proficiency in design skills.

05. Demonstrate proficiency in lettering skills.
06. Demonstrate an understanding of typography.
07. Demonstrate profficiency in layout and pasteup.
08. Demonstrate proficiency in illustration skills.
09. Demonstrate proficiency in applied design
10. Demonstrate proficiency in photostat camera skills.
11. Demonstrate proficiency in airbrush skills.
12. Demonstrate employability skills.
13. Demonstrate and understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS　　EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial　　SECONDARY NUMBER ____________

PROGRAM TITLE: Commercial Art　　PROGRAM NUMBER: ARV0990

01.0 DEMONSTRATE PROFICIENCY IN COMMUNICATION SKILLS--The student will be abl to:

01.01 Take notes, listen, and comply with instructions.
01.02 Read instructions thoroughly.
01.03 Request clarification of instructions (ask questions).
01.04 Relay instructions to others orally and in writing.
01.05 Define and explain commercial art terms.
01.06 Document job tasks and costs and maintain records.
01.07 Make project presentations.
01.08 Interact with your employer, fellow employees, and customers.

02.0 DEMONSTRATE PROFICIENCY IN GRAPHIC PRODUCTION--The student will be able to:

02.01 Define the differences in production processes, and estimate relative costs.
02.02 Recognize limitations for printing.
02.03 Identify and select different printing surfaces.
02.04 Identify standard industry material sizes.
02.05 Identify and select appropriate printing inks.
02.06 Specify types of folds.
02.07 Identify and select finishing processes.

03.0 DEMONSTRATE PROFICIENCY IN TECHNICAL ART SKILLS--The student will be able to:

03.01 Explain care and respect for all tools and equipment.
03.00 Make computations for centering, spacing, and scaling drawings.
03.03 Draw on various types of drafting media.
03.04 Interpret information from drawings, prints, and sketches.
03.05 Analyze an object to determine size and shape.
03.06 Draw freehand sketches.
03.07 Draw auxiliary views.
03.08 Draw an oblique drawing.
03.09 Draw an isometric drawing.
03.10 Draw a one and two point perspective.
03.11 Read and interpret technical charts, graphs, and diagrams.
03.10 Evaluate a drawing.
03.13 Make corrections on a drawing.
03.14 Draw in ink on a variety of surfaces.
03.15 Generate a glossary of technical terms.
03.16 Make an orthographic drawing using a computer-assisted drafting (CAD) system as an individual or team member.
03.17 Make a print on a plotter.

04.0 DEMONSTRATE PROFICIENCY IN DESIGN SKILLS--The student will be able to:

04.01 Explain proper use and care of tools.
04.02 Apply principles and elements of design.
04.03 Apply color theory (pigment vs. light).
04.04 Utilize tones, hues, and values.
04.05 Sketch designs using pencil and ink.
04.06 Paint decorative freehand designs and objects.
04.07 Use palette knife or brush to mix colors.
04.08 Paint freehand or within sketched designs using mixed colors, or apply colors to produce desired shades.
04.09 Create designs by stripping.
04.10 Apply color for impact (color psychology).
04.11 Demonstrate harmony and contrast of line and shape.
04.12 Demonstrate harmony and contrast of color and tone.
04.13 Demonstrate harmony and contrast of proportion.
04.14 Demonstrate harmony and contrast of texture pattern.
04.15 Demonstrate harmony and contrast of motion.
04.16 Indicate style appropriate to desired impact.

04.17 Differentiate between line halftone and duotone and four-color process.
04.18 Demonstrate balance in design.
04.19 Make a collage.
04.20 Demonstrate designs with symmetry and assymmetry.
04.21 Develop grids for layouts of magazine pages, ads, etc..

05.0 DEMONSTRATE PROFICIENCY IN LETTERING SKILLS--The student will be able to

05.01 Demonstrate use and care of tools, lettering pens, t-squares, and triangles.
05.0 Identify and select lettering styles.
05.03 Perform and use pen, brush, pencil, and LeRoy lettering.
05.04 Utilize guidelines, margins, and spacing for layouts.
05.05 Paint or draw precise lettering for reproduction.
05.06 Utilize various types of prepared lettering processes.
05.07 Produce a sign on posterboard.
05.08 Determine and select lettering styles for layout sketches.
05.09 Illuminate a certificate.

06.0 DEMONSTRATE AN UNDERSTANDING OF TYPOGRAPHY--The student will be able to:

06.01 Explain proper use, care, and cleaning of equipment.
06.02 Identify and select typography materials.
06.03 Define typographic terms, including leading and kerning.
06.04 Identify and select typographic styles.
06.05 Identify and select typographic methods.
06.06 Demonstrate the ability to proofread and use proofreaders' marks.
06.07 Explain picas and points and conversion to inches.
06.08 Define basic letter structures.
06.09 Demonstrate mixing of families of type.
06.10 Explain spec'ing type and copy fitting.

07.0 DEMONSTRATE PROFICIENCY IN LAYOUT AND PASTE-UP--The student will be able to:

07.01 Explain proper use and care of tools.
07.02 Explain layout and color trends.
07.03 Identify parts of a layout.
07.04 Utilize amberlith, rubylith, screens, overlays, and register marks.
07.05 Make thumbnail-sketch pencil layouts.
07.06 Prepare comprehensives from pencil layouts.
07.07 Prepare camera-ready mechanicals from comprehensives.
07.08 Prepare specific forms of instruction on mechanicals for presentations and for a printer.
07.09 Crop and scale artwork and/or photos for layouts.
07.10 Demonstrate enlarging or reducing with a grid or proportion wheel and other methods.
07.11 Make a color separation with overlays.
07.12 Demonstrate various ruling techniques.
07.13 Demonstrate the uses of different adhesives.
07.14 Specify the use of halftones or special effects.

08.0 DEMONSTRATE PROFICIENCY IN ILLUSTRATION SKILLS--The student will be able to:

08.01 Explain proper use and care of tools.
08.02 Demonstrate elementary anatomy drawing skills.
08.03 Illustrate using ink, pencil, washes, markers, tempera, watercolor, and paints.
08.04 Demonstrate renderings of different textures using the above media.
08.05 Make illustrations using various subjects.
08.06 Make a montage illustration.
08.07 Draw a cartoon.

09.0 DEMONSTRATE PROFICIENCY IN APPLIED DESIGN--The student will be able to:

09.01 Locate and identify resource materials and develop a morgue.
09.02 Apply advertising psychology.
09.03 Design logos.
09.04 Design stationery layouts.
09.05 Design a magazine/book cover or record jacket.
09.06 Design an ad campaign that includes newspapers, magazines, and billboards.
09.07 Produce an industrial brochure.
09.08 Design a consumer brochure.
09.09 Design a greeting card.
09.10 Construct a package design.
09.11 Design a business card.
09.12 Produce TV storyboards.
09.13 Develop a square and half-drop repeat design.
09.14 Produce computer-assisted artwork (optional).

10.0 DEMONSTRATE PROFICIENCY IN PHOTOSTAT CAMERA SKILLS (OPTIONAL)--The student will be able to:

10.01 Explain proper use and care of equipment, chemicals, and supplies
10.02 Identify parts of a camera.
10.03 Define photography terms.
10.04 Make negative and positive line shots on paper and film.
10.05 Make halftones.
10.06 Demonstrate enlarging and reducing.
10.07 Demonstrate stripping.
10.08 Demonstrate opaquing.

11.0 DEMONSTRATE PROFICIENCY IN AIRBRUSH SKILLS (OPTIONAL)--The student will be able to:

11.01 Explain proper use and care of tools.
11.02 Identify airbrush parts.
11.03 Perform airbrush exercises: dots, lines, and graded shadings.
11.04 Select appropriate surfaces and painting materials.
11.05 Define the use of masking materials.
11.06 Airbrush a painting using masks or brushes.
11.07 Airbrush geometric shapes.
11.08 Airbrush freehand painting.
11.09 Airbrush an illustration of a product.
11.10 Retouch photos

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other employees.
12.07 Identify and adopt acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.

13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Commercial Business Machine Maintenance

CODE NUMBER: Secondary ______ Postsecondary EST0560

Florida CIP IN47.010200

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-17

CERTIFICATION COVERAGE: BUS MACH 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as office machine servicers (633.281-018), typewriter repairers (706.381-030), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the maintenance and repair of a variety of office machines as typewriters, dictation machines, calculators, data processing equipment, duplicating machines, and mailing machines.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in diagnostic/troubleshooting technique, use of test equipment, and applied mechanics, and electrical/electronic theory as they relate to the repair of business machines.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate understanding of procedures.
02. Demonstrate proficiency in DC electronics.
03. Demonstrate proficiency in AC electronics.
04. Demonstrate proficiency in semi-conductor devices and circuits.
05. Demonstrate proficiency in electronic circuits.
06. Demonstrate proficiency in digital circuits and devices.
07. Read, interpret and write technical reports.
08. Troubleshoot, maintain and repair electronic typewriters.
09. Troubleshoot, maintain and repair electromechanical typewriters.
10. Troubleshoot, maintain and repair electronic printing calculators.

11. Troubleshoot, maintain and repair selenium drum process (SDP) copy equipment.
12. Troubleshoot, maintain and repair cadmium sulfide (CDS) copy equipment.
13. Troubleshoot, maintain and repair word processing equipment.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Commercial Business Machine Maintenance POSTSECONDARY NUMBER: EST0560

01.0 DEMONSTRATE UNDERSTANDING OF PROCEDURES--The student will be able to:

01.01 Explain class/school regulations and procedures.
01.02 Demonstrate safe work habits.

02.0 DEMONSTRATE PROFICIENCY IN DC ELECTRONICS--The student will be able to:

02.01 Solve basic algebraic problems as applicable to electronics (Program Prerequisite).
02.02 Relate electricity to nature of matter.
02.03 Identity sources of electricity.
02.04 Define voltage, current, resistance, power, and energy.
02.05 Apply and relate OHMS Law.
02.06 Read and interpret color codes to identify resistors.
02.07 Measure properties of a circuit using VOM and DVM meters.
02.08 Compute and measure conductance and resistance of conductors and insulators.
02.09 Analyze series circuits.
02.10 Construct series circuits.
02.11 Troubleshoot series circuits.
02.12 Analyze parallel circuits.
02.13 Construct parallel circuits.
02.14 Troubleshoot parallel circuits.
02.15 Analyze series-parallel circuits.
02.16 Construct series-parallel circuits.
02.17 Troubleshoot series-parallel circuits.
02.18 Analyze voltage dividers (loaded and unloaded).
02.19 Construct voltage dividers (loaded and unloaded).
02.20 Troubleshoot voltage dividers (loaded and unloaded).
02.21 Solve network theorem problems using Kirchhoff, (V & I) Thevenin, Norton, Superposition and Delta-wye.
02.22 Analyze maximum power transfer theory.
02.23 Construct maximum power transfer theory.
02.24 Troubleshoot maximum power transfer theory.
02.25 Define magnetic properties of circuits and devices.
02.26 Determine physical and electrical characteristics of capacitors and inductors.
02.27 Analyze and measure RL and RC time constants.
02.28 Set up and operate VOM for DC circuits.
02.29 Set up and operate DVM for DC circuits.
02.30 Set up and operate power supplies for DC circuits.
02.31 Set up and operate oscilloscopes for DC circuits.

03.0 DEMONSTRATE PROFICIENCY IN AC ELECTRONICS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electronics (Prerequisite to AC).
03.02 Identify properties of an AC signal.
03.03 Identify AC sources.
03.04 Analyze and measure AC signals using oscilloscope, frequency meters, and generators.
03.05 Analyze AC capacitive circuits.
03.06 Construct capacitive circuits.
03.07 Troubleshoot AC capacitive circuits.
03.08 Analyze AC inductive circuits.
03.09 Construct AC inductive circuits.
03.10 Troubleshoot AC inductive circuits.
03.11 Analyze and apply principles of transformers to AC circuits.
03.12 Analyze RLC circuits (series, parallel, complex).
03.13 Construct RLC circuits (series, parallel, complex).
03.14 Troubleshoot RLC circuits (series, parallel, complex).
03.15 Analyze series and parallel resonant circuits.
03.16 Construct series and parallel resonant circuits.
03.17 Troubleshoot series and parallel resonant circuits.
03.18 Analyze filter circuits.
03.19 Construct filter circuits.
03.20 Troubleshoot filter circuits.
03.21 Analyze polyphase circuits.

03.22 Construct polyphase circuits.
03.23 Troubleshoot polyphase circuits.
03.24 Analyze basic motor theory and operation.
03.25 Analyze basic generator theory and operation.
03.26 Set up and operate VOM for AC circuits.
03.27 Set up and operate DVM for AC circuits.
03.28 Set up and operate power supplies for AC circuits.
03.29 Set up and operate oscilloscopes for AC circuits.
03.30 Set up and operate frequency counters for AC circuits.
03.31 Set up and operate signal generators for AC circuits.
03.32 Set up and operate capacitor-inductor analyzers for AC circuits.
03.33 Set up and operate impedance bridges for AC circuits.

04.0 DEMONSTRATE PROFICIENCY IN SEMICONDUCTOR DEVICES THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS, USE OF TOOLS AND TEST EQUIPMENT, AND BASIC TROUBLESHOOTING PROCEDURES--The student will be able to:

04.01 Define the electrical characteristics of materials that are classified as semiconductors.
04.02 Define the primary advantages that semiconductor devices have over vacuum tubes and describe the operational characteristics of each.
04.03 Explain how the following semiconductor devices are constructed and how they operate:
    1. Semiconductor diodes.
    2. Zener diodes.
    3. Tunnel diodes.
    4. Varactor diodes.
    5. Pin diodes.
    6. IMPATT diodes.
    7. Hot Carrier diodes.
    8. Gun Effect diodes.
04.04 Explain how Bipolar Transistors are constructed and how they operate.
04.05 Describe the characteristics of a Common-Base circuit.
04.06 Describe the characteristics of a Common-Emitter circuit.
04.07 Describe the characteristics of a Common-Collector circuit.
04.08 Describe how following Field Effect Transistors are constructed and how they operate:
    1. Junction FET.
    2. Insulated Gate FET.
04.09 Describe how the following Thyristor devices are constructed and how they operate:
    1. Silicon Controlled Rectifier.
    2. Bidirectional Triode Thyristor.
    3. Unijunction Transistors.
04.10 Describe Integrated Circuits in terms of their importance, basic construction, and their application in digital and linear circuits.
04.11 Explain how the following Opto-electronic devices operate:
    1. Photoconductive Cells.
    2. Photovoltaic Cells.
    3. Photodiodes.
    4. Phototransistors.
    5. Light Emitting Diodes.
04.12 Use semiconductor components properly without exceeding their maximum ratings or damaging them with improper handling procedures.
04.13 Identify commonly used semiconductor packages.
04.14 Identify the schematic symbols that are used to identify various semiconductor devices.
04.15 Test various semiconductor devices to determine if they are functioning properly.

05.0 DEMONSTRATE PROFICIENCY IN ELECTRONIC CIRCUITS--The student will be able to:

05.01 Apply proper safety standards.
05.02 Make electrical connections.
05.03 Identify and use hand tools properly.
05.04 Identify and use power tools properly.
05.05 Handle static sensitive devices.
05.06 Identify and use fasteners (screws, washers, pins, connectors).
05.07 Establish and maintain an effective inventory control system.

05.08 Establish and maintain an effective parts control system for use in laboratory and maintenance vehicles.
05.09 Solder using proper soldering techniques.
05.10 Set up and operate scales.
05.11 Set up and operate micrometers.
05.12 Set up and operate rules.
05.13 Set up and operate drill blocks.
05.14 Set up and operate dial indicators.
05.15 Set up and operate vernier scales.
05.16 Set up and operate mechanical and optical measuring devices.
05.17 Set up and operate height gauges.
05.18 Set up and operate depth gauges.
05.19 Read and convert measurements.
05.20 Perform preventive maintenance according to vendor specifications.
05.21 Develop and implement preventive maintenance schedules.

06.0 DEMONSTRATE PROFICIENCY IN DIGITAL CIRCUITS AND DEVICES THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS, USE OF TOOLS AND TEST EQUIPMENT, AND BASIC TROUBLESHOOTING PROCEDURES--The student will be able to:

06.01 Define the advantages of using digital circuits in electronic equipment.
06.02 Convert binary to decimal numbers and vice versa. Recognize commonly used binary codes.
06.03 Identify major components used in implementing digital circuits and describe how they operate.
06.04 Construct and analyze digital logic gate circuits, identify schematic symbols, and develop truth tables for each of these gate circuits.
06.05 Identify the more commonly used integrated circuit families used in digital equipment and discuss their operation, characteristics, and features.
06.06 Use Boolean Algebra to express logic operations and minimize logic circuits in design.
06.07 Construct and analyze flip-flop circuits, identify schematic symbols and develop truth tables for each of these flip-flop circuits.
06.08 Identify the most frequently used combination logic circuits and describe their operation.
06.09 Design, construct, and analyze combination and sequential logic circuits for a given application from technical specifications. Prepare a technical report of findings
06.10 Demonstrate an understanding of the operation of digital counters in time and frequency measurements by applying the counter to digital and analog circuits.
06.11 Define how a digital computer is organized and how it operates.
06.12 Define microprocessor operation and give examples of their application.

07.0 READ, INTERPRET AND WRITE TECHNICAL REPORTS--The student will be able to:

07.01 Draw and interpret electrical, electronic, and mechanical schematics.
07.02 Write reports.
07.03 Maintain test logs.
07.04 Make equipment failure reports.
07.05 Specify and requisition simple electronic components.
07.06 Compose technical letters.
07.07 Write formal reports of laboratory experiences.

08.0 TROUBLESHOOT, MAINTAIN AND REPAIR ELECTRONIC TYPEWRITERS--The student will be able to:

08.01 Read and interpret schematic and block diagrams of electronic typewriters.
08.02 Determine the defective status of keyboards.
08.03 Troubleshoot keyboards.
08.04 Remove and replace keyboards or components.
08.05 Perform operating systems check and make minor adjustments to keyboards.
08.06 Perform preventive maintenance.
08.07 Determine the defective status of logic boards.

08.08 Troubleshoot logic boards.
08.09 Remove and replace logic boards or components.
08.10 Perform operating systems check and make minor adjustments to logic boards.
08.11 Perform preventive maintenance on logic boards.
08.12 Determine the defective status of printing carriers.
08.13 Troubleshoot printing carriers.
08.14 Remove and replace printing carriers or components.
08.15 Perform operating systems check and make minor adjustments to printing carriers.
08.16 Perform preventive maintenance on printing carriers.
08.17 Determine the defective status of power supplies.
08.18 Troubleshoot power supplies.
08.19 Remove and replace power supplies or components.
08.20 Perform operating systems check and make minor adjustments to power supplies.
08.21 Perform preventive maintenance on power supplies.

09.0 TROUBLESHOOT, MAINTAIN AND REPAIR ELECTROMECHANICAL TYPEWRITERS--The student will be able to:

09.01 Read and interpret schematic and block diagrams of electromechanical typewriters.
09.02 Determine the defective status of escapement mechanisms.
09.03 Troubleshoot escapement mechanisms.
09.04 Remove and replace escapement mechanisms or components.
09.05 Perform operating systems check and make minor adjustments to escapement mechanisms.
09.06 Perform preventive maintenance on escapement mechanisms.
09.07 Determine the defective status of keyboards.
09.08 Troubleshoot keyboards.
09.09 Remove and replace keyboards or components.
09.10 Perform operating systems check and make minor adjustments to keyboards.
09.11 Perform preventive maintenance on keyboards.
09.12 Determine the defective status of printing carriers.
09.13 Troubleshoot printing carriers.
09.14 Remove and replace printing carriers or components.
09.15 Perform operating systems check and make minor adjustments to printing carriers.
09.16 Perform preventive maintenance on printing carriers.
09.17 Determine the defective status of cycle clutch drives including motor.
09.18 Troubleshoot cycle clutch drives including motor.
09.19 Remove and replace cycle clutch drives including motor or components.
09.20 Perform operating systems check and make minor adjustments to cycle clutch drives including motor.
09.21 Perform preventive maintenance on cycle clutch drives including motor.
09.22 Determine the defective status of OP-CAM shafts.
09.23 Troubleshoot OP-CAM shafts.
09.24 Remove and replace OP-CAM shafts or components.
09.25 Perform operating systems check and make minor adjustments to OP-CAM shafts.
09.26 Perform preventive maintenance on OP-CAM shafts.

10.0 TROUBLESHOOT, MAINTAIN AND REPAIR ELECTRONIC PRINTING CALCULATORS--The student will be able to:

10.01 Read and interpret schematic and block diagrams on electronic printing calculators.
10.02 Determine the defective status of power supplies.
10.03 Troubleshoot power supplies.
10.04 Remove and replace power supplies or components.
10.05 Perform operating systems check and make minor adjustments to power supplies.
10.06 Perform preventive maintenance on power supplies.
10.07 Determine defective status of printing carriers.
10.08 Troubleshoot printing carriers.
10.09 Remove and replace printing carriers or components.
10.10 Perform operating systems check and make minor adjustments to printing carriers.
10.11 Perform preventive maintenance on printing carriers.
10.12 Determine defective status of logic boards.

10.13 Troubleshoot logic boards.
10.14 Remove and replace logic boards or components.
10.15 Perform operating systems check and make minor adjustments to logic boards.
10.16 Perform preventive maintenance on logic boards.
10.17 Determine defective status of keyboards.
10.18 Troubleshoot keyboards.
10.19 Remove and replace keyboards or components.
10.20 Perform operating systems check and make minor adjustments to keyboards.
10.21 Perform preventive maintenance on keyboards.

11.0 TROUBLESHOOT, MAINTAIN AND REPAIR SELENIUM DRUM PROCESS (SDP) COPY EQUIPMENT--The student will be able to:

11.01 Read and interpret schematic and block diagrams on SDP copy equipment.
11.02 Determine the defective status of power supplies.
11.03 Troubleshoot power supplies.
11.04 Remove and replace power supplies or components.
11.05 Perform operating systems check and make minor adjustments to power supplies.
11.06 Perform preventive maintenance on power supplies.
11.07 Determine the defective status of logic boards.
11.08 Troubleshoot logic boards.
11.09 Remove and replace logic boards or components.
11.10 Perform operating systems check and make minor adjustments to logic boards.
11.11 Perform preventive maintenance on logic boards.
11.12 Determine the defective status of optic systems.
11.13 Troubleshoot optic systems.
11.14 Remove and replace optic systems or components.
11.15 Perform operating systems check and make minor adjustments to optic systems.
11.16 Perform preventive maintenance on optic systems.
11.17 Determine the defective status of fusing systems.
11.18 Troubleshoot fusing systems.
11.19 Remove and replace fusing systems or components.
11.20 Perform operating systems check and make minor adjustments to fusing system.
11.21 Perform preventive maintenance on fusing systems.

12.0 TROUBLESHOOT, MAINTAIN AND REPAIR CADMIUM SULFIDE (CDS) COPY EQUIPMENT--The student will be able to:

12.01 Read and interpret schematic and block diagrams on CDS process copy equipment.
12.02 Determine the defective status of power supplies.
12.03 Troubleshoot power supplies.
12.04 Remove and replace power supplies or components.
12.05 Perform operating systems check and make minor adjustments to power supplies.
12.06 Perform preventive maintenance on power supplies.
12.07 Determine the defective status of logic boards.
12.08 Troubleshoot logic boards.
12.09 Remove and replace logic boards and components.
12.10 Perform operating systems check and make minor adjustments to logic boards.
12.11 Perform preventive maintenance on logic boards.
12.12 Determine the defective status of optic systems.
12.13 Troubleshoot optic systems.
12.14 Remove and replace optic systems or components.
12.15 Perform operating systems check and make minor adjustments to optic systems.
12.16 Perform preventive maintenance on optic systems.
12.17 Determine the defective status of fusing systems.
12.18 Troubleshoot fusing systems.
12.19 Remove and replace fusing systems or components.
12.20 Perform operating systems check and make minor adjustments to fusing systems.
12.21 Perform preventive maintenance on fusing systems.

13.0 TROUBLESHOOT, MAINTAIN AND REPAIR WORD PROCESSING EQUIPMENT--The student will be able to:

13.01 Read and interpret schematic and block diagrams of microcomputers (word processing equipment).
13.02 Determine the defective status of systems software.
13.03 Troubleshoot system software.
13.04 Remove and replace system software or components.
13.05 Perform operating systems check and make minor adjustments to system software.
13.06 Perform preventive maintenance on systems software.
13.07 Determine the defective status of power supplies.
13.08 Troubleshoot power supplies.
13.09 Remove and replace power supplies or components.
13.10 Perform operating systems check and make minor adjustments to power supplies.
13.11 Perform preventive maintenance on power supplies.
13.12 Determine the defective status of daisy wheel printing.
13.13 Troubleshoot daisy wheel printers.
13.14 Remove and replace daisy wheel printers or components.
13.15 Perform operating systems check and make minor adjustments to daisy wheel printers.
13.16 Perform preventive maintenance on daisy wheel printers.
13.17 Determine the defective status of dot matrix printers.
13.18 Troubleshoot dot matrix printers.
13.19 Remove and replace dot matrix printers and components.
13.20 Perform operating systems check and make minor adjustments to dot matrix printers.
13.21 Perform preventive maintenance on dot matrix printers.
13.22 Determine the defective status of logic boards.
13.23 Troubleshoot logic boards.
13.24 Remove and replace logic boards or components.
13.25 Perform operating systems check and make minor adjustments to logic boards or components.
13.26 Perform preventive maintenance on logic boards.
13.27 Determine the defective status of keyboards.
13.28 Troubleshoot keyboards.
13.29 Remove and replace keyboards or components.
13.30 Perform operating systems check and make minor adjustments to keyboards.
13.31 Perform preventive maintenance on keyboards.
13.32 Determine the defective status of display/CRT terminals.
13.33 Troubleshoot display/CRT terminals.
13.34 Remove and replace display/CRT terminals or components.
13.35 Perform operating systems check and make minor adjustments to display/CRT terminals.
13.36 Perform preventive maintenance on display/CRT terminals.
13.37 Determine the defective status of disc drives.
13.38 Troubleshoot disc drives.
13.39 Remove and replace disc drives or components.
13.40 Perform operating systems check and make minor adjustments to disc drives.
13.41 Perform preventive maintenance on disc drives.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Commercial Fishing

CODE NUMBER: Secondary 8751200 Postsecondary MTE0998

Florida CIP IN49.030300

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS _____

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 10-12, 13-17, 21

CERTIFICATION COVERAGE: COMM FISH 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment with occupational titles as net fishers (411.684-010), pot fishers (441.684-014), shrimp boat deckhands (449.667-010), line fishers (442.684-010) or to provide supplemental training for persons previously or currently employed in these occupations.

The plan of instruction prepares individuals for crew duties on seagoing boats, barges and ships. Included are boat operation, fishing operations, cleaning and preservation, loading and unloading and emergency procedures.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, crew duties on seagoing boats, trailers, and small ships. Included and vessel operation and maintenance, vessel navigation, vessel handling, shrimp and net fishing, pot and line fishing, and galley operation/food preparation.

Listed below are the courses that comprise this program when offered at the secondary level:

8751210	Commercial Fishing 1
8751220	Commercial Fishing 2
8751230	Commercial Fishing 3
8751240	Commercial Fishing 4
8751250	Commercial Fishing 5
8751260	Commercial Fishing 6

II. LABORATORY ACTIVITIES: Laboratory and onboard activities are an integral part of this program and provide instruction in the safe and efficient operation of commercial watercraft and related systems. Emphasis is placed on vessel operations and fishing techniques.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this vocational program: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 900 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Dock a vessel.
02. Unlock and get a vessel underway.
03. Operate a vessel at sea.
04. Maneuver around offshore structures.
05. Anchor vessel.
06. Perform shrimp boat deckhand duties.
07. Perform net fisher duties.
08. Perform pot fisher duties.
09. Perform line fisher duties.
10. Bring vessel into port.
11. Perform crew operational and maintenance duties aboard a vessel in port.
12. Prepare meals aboard a vessel.
13. Plan and perform emergency procedures.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — SECONDARY NUMBER: 8751200

PROGRAM TITLE: Commercial Fishing — POSTSECONDARY NUMBER: MTE0998

01.0 DOCK A VESSEL--The student will be able to:

01.01 Assign crew members' positions for mooring vessel.
01.02 Cast off vessel's mooring lines while remaining on dock.
01.03 Cast off vessel's mooring lines while remaining aboard vessel.
01.04 Maneuver vessel to dock.
01.05 Release towing gear aboard lowing vessel and barges.
01.06 Secure mooring lines to dock.
01.07 Secure mooring lines to vessel.
01.08 Secure engine room.
01.09 Secure propeller shaft.

02.0 UNLOCK AND GET VESSEL UNDERWAY--The student will be able to:

02.01 Bleed air compressor of water.
02.02 Check and maintain batteries.
02.03 Measure fuel in day tank.
02.04 Maintain proper level of coolant in expansion tank.
02.05 Determine if all navigation lights are functioning.
02.06 Tighten engine mounts.
02.07 Inspect water level indicators for cleanliness.
02.08 Test marine radio equipment.
02.09 Inspect antenna for physical damage.
02.10 Determine if hydraulic steering equipment is free of air and water.
02.11 Inspect fire-fighting equipment for excessive wear, proper location, and prescribed type.
02.12 Inspect buoyant apparatus for excessive wear, proper location, and prescribed type.
02.13 Determine that rudder stuffing box is functioning properly.
02.14 Tighten propeller stuffing box.
02.15 Inspect vessel for fuel leakage.
02.16 Prepare list of equipment to be checked for oil leakage.
02.17 Determine if proper voltage is being generated.
02.18 Maneuver vessel from birth into navigable waterway.
02.19 Pump out bilges.
02.20 Secure loose deck equipment.
02.21 Secure watertight doors, hatches, vents, and skylights.

03.0 OPERATE VESSEL AT SEA--The student will be able to:

03.01 Act as vessel's lookout.
03.02 Determine if electrical connections and outlets are tight and dry.
03.03 Determine if electrical outlets have proper voltage.
03.04 Change air filters on engines.
03.05 Change oil and fuel filters on engines.
03.06 Change oil in engine.
03.07 Chip and paint vessel.
03.08 Clean engine room and its equipment.
03.09 Determine time of arrival when current effect is known.
03.10 Determine time of arrival when current effect is unknown.
03.11 Display day or night signals for different lowing situations.
03.12 Inspect heaving lines, mooring lines, and fixed and running rigging for excessive wear.
03.13 Determine Greenwich Mean Time (GMT) by using vessel's chronometer.
03.14 Determine position by using Omega navigation system.
03.15 Steer a course by using the magnetic compass.
03.16 Determine "distance off" by using angular measurements.
03.17 Establish a vessel's dead reckoning (DR) track.
03.18 Determine position by means of celestial navigation.
03.19 Plot position by using Loran and Loran overprint charts.
03.20 Set sea watches.

04.0 MANEUVER AROUND OFFSHORE STRUCTURES--The student will be able to:

04.01 Assist personnel in boarding personnel basket.
04.02 Maneuver vessel to discharge passengers.
04.03 Maneuver vessel to discharge cargo.
04.04 Secure hoses on board vessel.
04.05 Secure lashings, hausers, or moving lines on board vessel.

05.0 ANCHOR VESSEL--The student will be able to:

05.01 Anchor vessel.
05.02 Maneuver vessel to anchorage area.
05.03 Anchor vessel by using anchor winch.
05.04 Anchor vessel by using anchor windlass.
05.05 Stack (tier) anchor chain in chain locker.

06.0 PERFORM SHRIMP BOARD DECKHAND DUTIES--The student will be able to:

06.01 Stand lookout, steering, and engine room watches.
06.02 Attach nets, slings, hooks, and other lifting devices to cables, booms, and hoists.
06.03 Load equipment and supplies aboard vessel by hand or using hoisting equipment.
06.04 Signal other workers to move, hoist, and position loads.
06.05 Row boats and dinghies and operate skiffs to transport fishers, and to tow and position nets.
06.06 Attach accessories, such as floats, weights, and markers to nets and lines.
06.07 Pull and guide nets and lines onto vessel.
06.08 Remove shrimp from nets.
06.09 Sort and clean marine life and return undesirable and illegal catch to the sea.
06.10 Place catch in containers and store in hold and cover with salt and ice.
06.11 Wash deck, conveyors, knives, and other equipment, using brush, detergent, and water.
06.12 Lubricate, adjust, and make minor repairs to engines and equipment.

07.0 PERFORM NET FISHER DUTIES--The student will be able to:

07.01 Catch finfish, shellfish, and other marine life alone or as crew member aboard fishing vessel.
07.02 Use and operate equipment such as dip, diver, gill, hoop, lampara, pound, trap, reef, trammel, and travel nets.
07.03 Use and operate equipment such as purse seine, haul, drag, or beach seine.
07.04 Insert and attach hoops, rods, poles, ropes, floats, weights, beam runners, other boards, and cables to form, reinforce, position, set, tow, and anchor net.
07.05 Attach flags and lights to buoys to identify net location.
07.06 Put net into water and archor or tow net according to kind of net used, location of fishing area, and method of fishing.
07.07 Haul net to boat or shore manually and using winch.
07.08 Empty catch from net, using dip net, brail buckets, hydraulic pump, and conveyor, and by lifting net, using block and tackle, and dumping catch.
07.09 Store catch in hold and containers, or transfer catch to base ship or bigger boat.
07.10 Ride in skiff and hold end of net as base ship discharges net to surround school of fish or other seafood.
07.11 Sort and clean fish.
07.12 Repair fishing nets and gear.
07.13 Act as lookout or observe instruments to sight schools of fish.

08.0 PERFORM POT FISHER DUTIES--The student will be able to:

08.01 Fish for marine life, including crab, eel, or lobster, using pots (cages with funnel-shaped net openings).
08.02 Tie marker float to line, attach line to pot, fasten bait inside pot, and lower pot into water.
08.03 Hook marker float with pole and pull up pot.
08.04 Reach through hinged door of pot to remove catch or dump catch on deck.
08.05 Measure catch with fixed gauge to insure compliance with legal size.
08.06 Place legal catch in container and toss illegal catch overboard.
08.07 Place peg in hinge of claws to prevent lobsters in container from killing each other.
08.08 Rig and lower dredge (rake scoop with bag net attached), drag dredge behind boat to gather marine life from water bottom, and hoist it to deck by hand using block and tackle.

09.0 PERFORM LINE FISHER DUTIES--The student will be able to:

09.01 Catch fish and other marine life with hooks and lines, working alone or as a member of crew.
09.02 Lay out line and attach hooks, bait sinkers, and various anchors, floats, and swivels, depending on quarry sought.
09.03 Put line into water, and hold, anchor, or troll (tow) line to catch fish.
09.04 Haul line onto boat deck by hand, reel, or winch, and remove catch.
09.05 Store catch in hold or boxes and pack catch in ice.
09.06 Hit fish with club to stun it before removing it from hook.
09.07 Use gaff to assist in hauling fish from water.
09.08 Slit fish, move viscera, and wash cavity to clean fish for storage.
09.09 Steer vessel in fishing area.

10.0 BRING VESSEL INTO PORT--The student will be able to:

10.01 Determine approximate position and hazardous bottom conditions by using pathometer.
10.02 Determine position by using radio direction finder (RDF).
10.03 Inspect engine room equipment for proper maintenance and safety.
10.04 Determine vessel's course and position against dead reckoning plots.
10.05 Correct nautical chart prior to departure.
10.06 Prepare vessel to take on fuel and lube oil.
10.07 Prepare to take on water aboard vessel.

11.0 PERFORM CREW OPERATIONAL AND MAINTENANCE DUTIES ABOARD VESSEL IN PORT--The student will be able to:

11.01 Arrange for dry docking vessel.
11.02 Change brushes in auxiliary engines.
11.03 Change lube oil filters on auxiliary engines.
11.04 Change fuel filters on auxiliary engines.
11.05 Determine if motor bearings are excessively worn.
11.06 Clean electric motor.
11.07 Prepare list of hoses, valves, connections, gaskets, and tanks needing repairs.
11.08 Determine if const-a-voltage regulator is functioning properly.
11.09 Determine if drive bolts on air compressors are excessively loose.
11.10 Tighten panel box fittings to prevent vibration.
11.11 Clean keel cool strainers.
11.12 Clean oil coolers.
11.13 Clean oil strainers in marine gears.
11.14 Drain water out of fuel traps.
11.15 Tighten fuel and oil line connections on engines.
11.16 Inspect day tanks containing fuel for leaks.
11.17 Lubricate deck and engine room equipment on a regular schedule.
11.18 Determine vessel's manning requirements.
11.19 Splice eye into line.
11.20 Wash down vessel's superstructure and decks.

12.0 PREPARE MEALS ABOARD VESSEL--The student will be able to:

12.01 Make yeast breads.
12.02 Make pie crust.
12.03 Make cream filling in pie.
12.04 Make pancakes.
12.05 Make corn bread.
12.06 Make cakes.
12.07 Make biscuits.
12.08 Clean galley deck, woodwork, and cabinets.
12.09 Wash dishes, glasses, flatware, trays, pots and pans.
12.10 Cook vegetables by boiling, simmering, and steaming.
12.11 Cook meats, seafood, and fowl by frying.
12.12 Cook meats, seafood, and fowl by stewing and braising.
12.13 Cook meats, seafood, and fowl by broiling.
12.14 Cook meats, seafood, and fowl by roasting or baking.
12.15 Cook meats, seafood, and fowl by braising.
12.16 Season and bread meats, seafood, and fowl for baking, roasting, broiling and frying.
12.17 Cook eggs by frying and scrambling.
12.18 Make gravies.
12.19 Make coffee.
12.20 Make salads.
12.21 Prepare soup stock.

12.22 Prepare sandwiches.
12.23 Prepare dehydrated or concentrated foods.
12.24 Make soup with stock, meats, vegetables, and seasonings, as required by recipe.
12.25 Carve cooled meats.
12.26 Cut, trim, and bone beef, lamb, pork, or fish into prescribed portions for steaks, chops, and fillets.
12.27 Clean and care for equipment.
12.28 Order food.
12.29 Plan menus.
12.30 Keep records for purchasing foods.
12.31 Store food.
12.32 Keep continuous inventory of food items.

13.0 PLAN AND PERFORM EMERGENCY PROCEDURES--The student will be able to:

13.01 Act as lookout to keep person in sight who has been lost overboard.
13.02 Administer first aid to prevent shock.
13.03 Administer first aid to control bleeding.
13.04 Administer CPR.
13.05 Launch lifeboat and lift raft.
13.06 Close emergency fuel shutoff valves.
13.07 Extinguish Class "C" fire.
13.08 Maneuver life raft or lifeboat away from vessel.
13.09 Maneuver vessel to return to area in which person was lost overboard.
13.10 Issue life preservers for use by passengers and crew.
13.11 Secure engine room to prevent spread of fire.
13.12 Send out distress signals.
13.13 Sound abandon-ship alarm.
13.14 Train crew to perform emergency procedures.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Commercial Fishing

PROGRAM NUMBER: 8751200

COURSE TITLE: Commercial Fishing 1

COURSE NUMBER: 8751210

COURSE DESCRIPTION:

This course includes instruction in vessel docking, undocking crew operations and maintenance duties, planning and performance of emergency procedures and employability skills.

01.0 DOCK A VESSEL--The student will be able to:

01.01 Assign crew members' positions for mooring vessel.
01.02 Cast off vessel's mooring lines while remaining on dock.
01.03 Cast off vessel's mooring lines while remaining aboard vessel.
01.04 Maneuver vessel to dock.
01.05 Release towing gear aboard lowing vessel and barges.
01.06 Secure mooring lines to dock.
01.07 Secure mooring lines to vessel.
01.08 Secure engine room.
01.09 Secure propeller shaft.

02.0 UNLOCK AND GET VESSEL UNDERWAY--The student will be able to:

02.01 Bleed air compressor of water.
02.02 Check and maintain batteries.
02.03 Measure fuel in day tank.
02.04 Maintain proper level of coolant in expansion tank.
02.05 Determine if all navigation lights are functioning.
02.06 Tighten engine mounts.
02.07 Inspect water level indicators for cleanliness.
02.08 Test marine radio equipment.
02.09 Inspect antenna for physical damage.
02.10 Determine if hydraulic steering equipment is free of air and water.
02.11 Inspect fire-fighting equipment for excessive wear, proper location, and prescribed type.
02.12 Inspect buoyant apparatus for excessive wear, proper location, and prescribed type.
02.13 Determine that rudder stuffing box is functioning properly.
02.14 Tighten propeller stuffing box.
02.15 Inspect vessel for fuel leakage.
02.16 Prepare list of equipment to be checked for oil leakage.
02.17 Determine if proper voltage is being generated.
02.18 Maneuver vessel from birth into navigable waterway.
02.19 Pump out bilges.
02.20 Secure loose deck equipment.
02.21 Secure watertight doors, hatches, vents, and skylights.

11.0 PERFORM CREW OPERATIONAL AND MAINTENANCE DUTIES ABOARD VESSEL IN PORT--The student will be able to:

11.01 Arrange for dry docking vessel.
11.02 Change brushes in auxiliary engines.
11.03 Change lube oil filters on auxiliary engines.
11.04 Change fuel filters on auxiliary engines.
11.05 Determine if motor bearings are excessively worn.
11.06 Clean electric motor.
11.07 Prepare list of hoses, valves, connections, gaskets, and tanks needing repairs.
11.08 Determine if const-a-voltage regulator is functioning properly.
11.09 Determine if drive bolts on air compressors are excessively loose.
11.10 Tighten panel box fittings to prevent vibration.
11.11 Clean keel cool strainers.
11.12 Clean oil coolers.
11.13 Clean oil strainers in marine gears.
11.14 Drain water out of fuel traps.
11.15 Tighten fuel and oil line connections on engines.
11.16 Inspect day tanks containing fuel for leaks.
11.17 Lubricate deck and engine room equipment on a regular schedule.
11.18 Determine vessel's manning requirements.
11.19 Splice eye into line.
11.20 Wash down vessel's superstructure and decks.

13.0 PLAN AND PERFORM EMERGENCY PROCEDURES--The student will be able to:

13.01 Act as lookout to keep person in sight who has been lost overboard.
13.02 Administer first aid to prevent shock.
13.03 Administer first aid to control bleeding.
13.04 Administer CPR.
13.05 Launch lifeboat and lift raft.
13.06 Close emergency fuel shutoff valves.
13.07 Extinguish Class "C" fire.
13.08 Maneuver life raft or lifeboat away from vessel.
13.09 Maneuver vessel to return to area in which person was lost overboard.
13.10 Issue life preservers for use by passengers and crew.
13.11 Secure engine room to prevent spread of fire.
13.12 Send out distress signals.
13.13 Sound abandon-ship alarm.
13.14 Train crew to perform emergency procedures.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Commercial Fishing
PROGRAM NUMBER: 8751200

COURSE TITLE: Commercial Fishing 2
COURSE NUMBER: 8751220

COURSE DESCRIPTION:

This course includes instruction in vessel operation at sea and navigation.

03.0 OPERATE VESSEL AT SEA--The student will be able to:

03.01 Act as vessel's lookout.
03.02 Determine if electrical connections and outlets are tight and dry.
03.03 Determine if electrical outlets have proper voltage.
03.04 Change air filters on engines.
03.05 Change oil and fuel filters on engines.
03.06 Change oil in engine.
03.07 Chip and paint vessel.
03.08 Clean engine room and its equipment.
03.09 Determine time of arrival when current effect is known.
03.10 Determine time of arrival when current effect is unknown.
03.11 Display day or night signals for different lowing situations.

03.12 Inspect heaving lines, mooring lines, and fixed and running rigging for excessive wear.
03.13 Determine Greenwich Mean Time (GMT) by using vessel's chronometer.
03.14 Determine position by using Omega navigation system.
03.15 Steer a course by using the magnetic compass.
03.16 Determine "distance off" by using angular measurements.
03.17 Establish a vessel's dead reckoning (DR) track.
03.18 Determine position by means of celestial navigation.
03.19 Plot position by using Loran and Loran overprint charts.
03.20 Set sea watches.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Commercial Fishing
PROGRAM NUMBER: 8751200

COURSE TITLE: Commercial Fishing 3
COURSE NUMBER: 8751230

COURSE DESCRIPTION:

This course includes instruction in vessel maneuvering, securing hoses, securing lashing, hausers or mooring lines, anchoring and bringing vessel into port.

04.0 MANEUVER AROUND OFFSHORE STRUCTURES--The student will be able to:

04.01 Assist personnel in boarding personnel basket.
04.02 Maneuver vessel to discharge passengers.
04.03 Maneuver vessel to discharge cargo.
04.04 Secure hoses on board vessel.
04.05 Secure lashings, hausers, or moving lines on board vessel.

05.0 ANCHOR VESSEL--The student will be able to:

05.01 Anchor vessel.
05.02 Maneuver vessel to anchorage area.
05.03 Anchor vessel by using anchor winch.
05.04 Anchor vessel by using anchor windlass.
05.05 Stack (tier) anchor chain in chain locker.

10.0 BRING VESSEL INTO PORT--The student will be able to:

10.01 Determine approximate position and hazardous bottom conditions by using pathometer.
10.02 Determine position by using radio direction finder (RDF).
10.03 Inspect engine room equipment for proper maintenance and safety.
10.04 Determine vessel's course and position against dead reckoning plots.
10.05 Correct nautical chart prior to departure.
10.06 Prepare vessel to take on fuel and lube oil.
10.07 Prepare to take on water aboard vessel.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Commercial Fishing
PROGRAM NUMBER: 8751200

COURSE TITLE: Commercial Fishing 4
COURSE NUMBER: 8751240

COURSE DESCRIPTION:

The student will perform the duties associated with fishing, to include shrimp, net fishing and deckhand duties.

06.0 PERFORM SHRIMP BOARD DECKHAND DUTIES--The student will be able to:

06.01 Stand lookout, steering, and engine room watches.
06.02 Attach nets, slings, hooks, and other lifting devices to cables, booms, and hoists.

06.03 Load equipment and supplies aboard vessel by hand or using hoisting equipment.
06.04 Signal other workers to move, hoist, and position loads.
06.05 Row boats and dinghies and operate skiffs to transport fishers, and to tow and position nets.
06.06 Attach accessories, such as floats, weights, and markers to nets and lines.
06.07 Pull and guide nets and lines onto vessel.
06.08 Remove shrimp from nets.
06.09 Sort and clean marine life and return undesirable and illegal catch to the sea.
06.10 Place catch in containers and store in hold and cover with salt and ice.
06.11 Wash deck, conveyors, knives, and other equipment, using brush, detergent, and water.
06.12 Lubricate, adjust, and make minor repairs to engines and equipment.

07.0 PERFORM NET FISHER DUTIES--The student will be able to:

07.01 Catch finfish, shellfish, and other marine life alone or as crew member aboard fishing vessel.
07.02 Use and operate equipment such as dip, diver, gill, hoop, lampara, pound, trap, reef, trammel, and travel nets.
07.03 Use and operate equipment such as purse seine, haul, drag, or beach seine.
07.04 Insert and attach hoops, rods, poles, ropes, floats, weights, beam runners, other boards, and cables to form, reinforce, position, set, tow, and anchor net.
07.05 Attach flags and lights to buoys to identify net location.
07.06 Put net into water and archor or tow net according to kind of net used, location of fishing area, and method of fishing.
07.07 Haul net to boat or shore manually and using winch.
07.08 Empty catch from net, using dip net, brail buckets, hydraulic pump, and conveyor, and by lifting net, using block and tackle, and dumping catch.
07.09 Store catch in hold and containers, or transfer catch to base ship or bigger boat.
07.10 Ride in skiff and hold end of net as base ship discharges net to surround school of fish or other seafood.
07.11 Sort and clean fish.
07.12 Repair fishing nets and gear.
07.13 Act as lookout or observe instruments to sight schools of fish.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Commercial Fishing PROGRAM NUMBER: 8751200

COURSE TITLE: Commercial Fishing 5 COURSE NUMBER: 8751250

COURSE DESCRIPTION:

This course will provide instruction in the procedures for pot and line fishing.

08.0 PERFORM POT FISHER DUTIES--The student will be able to:

08.01 Fish for marine life, including crab, eel, or lobster, using pots (cages with funnel-shaped net openings).
08.02 Tie marker float to line, attach line to pot, fasten bait inside pot, and lower pot into water.
08.03 Hook marker float with pole and pull up pot.
08.04 Reach through hinged door of pot to remove catch or dump catch on deck.
08.05 Measure catch with fixed gauge to insure compliance with legal size.
08.06 Place legal catch in container and toss illegal catch overboard.
08.07 Place peg in hinge of claws to prevent lobsters in container from killing each other.
08.08 Rig and lower dredge (rake scoop with bag net attached), drag dredge behind boat to gather marine life from water bottom, and hoist it to deck by hand using block and tackle.

09.0 PERFORM LINE FISHER DUTIES--The student will be able to:

09.01 Catch fish and other marine life with hooks and lines, working alone or as a member of crew.
09.02 Lay out line and attach hooks, bait sinkers, and various anchors, floats, and swivels, depending on quarry sought.
09.03 Put line into water, and hold, anchor, or troll (tow) line to catch fish.
09.04 Haul line onto boat deck by hand, reel, or winch, and remove catch.
09.05 Store catch in hold or boxes and pack catch in ice.
09.06 Hit fish with club to stun it before removing it from hook.
09.07 Use gaff to assist in hauling fish from water.
09.08 Slit fish, move viscera, and wash cavity to clean fish for storage.
09.09 Steer vessel in fishing area.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Commercial Fishing

PROGRAM NUMBER: 8751200

COURSE TITLE: Commercial Fishing 6

COURSE NUMBER: 8751260

COURSE DESCRIPTION:

This course will provide instruction in ship board meal preparation.

12.0 PREPARE MEALS ABOARD VESSEL--The student will be able to:

12.01 Make yeast breads.
12.02 Make pie crust.
12.03 Make cream filling in pie.
12.04 Make pancakes.
12.05 Make corn bread.
12.06 Make cakes.
12.07 Make biscuits.
12.08 Clean galley deck, woodwork, and cabinets.
12.09 Wash dishes, glasses, flatware, trays, pots and pans.
12.10 Cook vegetables by boiling, simmering, and steaming.
12.11 Cook meats, seafood, and fowl by frying.
12.12 Cook meats, seafood, and fowl by stewing and braising.
12.13 Cook meats, seafood, and fowl by broiling.
12.14 Cook meats, seafood, and fowl by roasting or baking.
12.15 Cook meats, seafood, and fowl by braising.
12.16 Season and bread meats, seafood, and fowl for baking, roasting, broiling and frying.
12.17 Cook eggs by frying and scrambling.
12.18 Make gravies.
12.19 Make coffee.
12.20 Make salads.
12.21 Prepare soup stock.
12.22 Prepare sandwiches.
12.23 Prepare dehydrated or concentrated foods.
12.24 Make soup with stock, meats, vegetables, and seasonings, as required by recipe.
12.25 Carve cooled meats.
12.26 Cut, trim, and bone beef, lamb, pork, or fish into prescribed portions for steaks, chops, and fillets.
12.27 Clean and care for equipment.
12.28 Order food.
12.29 Plan menus.
12.30 Keep records for purchasing foods.
12.31 Store food.
12.32 Keep continuous inventory of food items.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Commercial Foods

CODE NUMBER: Secondary 8763000 Postsecondary ____________

Florida CIP IN20.041300

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

___ Postsecondary Vocational _x_ Other 10 - 12, 21

CERTIFICATION COVERAGE: COMM COOK @ 7 COMM BAKER @ 7
QUAN FOOD 7 VOC HME EC 4

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as baker, dessert, and pastry maker (313.381-026), beverage maker & fountain person (319.474-010), entree cook (313.361-014), fryer and griddle cook (313.361-022), salad/sandwich maker (317.684-014), fruit and vegetable cook (313.361-014), cook's helper (317.687-010), manager/supervisor (187.167-106), host or hostess/cashier (310.137-010), waiter/waitress/bus person (311.477-030), counter worker/cafeteria line worker (311.677-014), utility worker (311.677-018).

Listed below are the courses that make up this program when offered at the secondary level.

8763010	Commercial Foods 1
8763020	Commercial Foods 2
8763030	Commercial Foods 3
8763040	Commercial Foods 4
8763050	Commercial Foods 5
8763060	Commercial Foods 6

II. LABORATORY ACTIVITIES: Kitchen or food preparation and serving laboratory activities are an integral part of this program, and include identification, storage, selection, preparation and presentation of a wide varietry of foods commensurate with student goals and training specializations.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc. is an appropriate vocational student organization for providing communications, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher, and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the students' individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfuly completing this program the student will be able to:

01. Demonstrate proficiency in general housekeeping operations.
02. Demonstrate proficiency in equipment operation skills.
03. Demonstrate proficiency in stock, soup, and sauce preparation skills.
04. Demonstrate proficiency in fruit and vegetables preparation skills.
05. Demonstrate proficiency in meat, poultry, fish, and seafood preparation skills.
06. Demonstrate proficiency in dairy, egg, and farinaceous (starchy) product preparation skills.
07. Demonstrate proficiency in salad, buffet food, beverage, and related food preparation skills.
08. Demonstrate proficiency in bakery goods and dessert preparation skills.
09. Demonstrate proficiency in dining room operations skills.
10. Demonstrate proficiency in customer relations.
11. Demonstrate proficiency in employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial SECONDARY NUMBER 8763000

PROGRAM TITLE: Commercial Foods PROGRAM NUMBER: ____________

01.0 DEMONSTRATE GENERAL HOUSEKEEPING OPERATIONS SKILLS--The student will be able to:

01.01 Receive goods.
01.02 Store goods.
01.03 Distribute goods.
01.04 Clean storage and receiving areas.
01.05 Clean refrigerators and freezers.
01.06 Inventory goods.
01.07 Prepare daily food order.
01.08 Prepare work area.
01.09 Clean work area.
01.10 Store pots and pans.
01.11 Prepare dishwashing area.
01.12 Prepare dishware for washing.
01.13 Wash dishwares.
01.14 Clean dishwashing area.
01.15 Clean restrooms.
01.16 Clean floors.
01.17 Clean walls.
01.18 Clean filters.
01.19 Maintain clean and sanitary working area.
01.20 Read and follow equipment operating instructions.
01.21 Recognize and correct or report safety hazards.
01.22 Identify and select cleaning agents.

02.0 DEMONSTRATE EQUIPMENT OPERATION SKILLS--The student will be able to:

02.01 Select and use hand tools.
02.02 Operate beverage equipment.
02.03 Set, control, load and unload ovens for roasting.
02.04 Use pressure cookers and steam equipment.
02.05 Disassemble, clean, and reassemble kitchen equipment.
02.06 Operate microwave ovens.
02.07 Operate grinders and tenderizers.
02.08 Select, handle, and sharpen knives and other cutting tools.
02.09 Operate ranges, griddles, fryers, broilers, and toasters.
02.10 Operate proofers.
02.11 Operate mixers and blenders.
02.12 Operate slicing machines.
02.13 Set up and monitor food warmers.
02.14 Operate convection ovens.
02.15 Identify need for and report request tool and equipment repairs.

03.0 DEMONSTRATE STOCK, SOUP, AND SAUCE PREPARATION SKILLS--The student will be able to:

03.01 Prepare basic white stocks.
03.02 Store and handle stocks, soups, and sauces.
03.03 Prepare basic brown stocks.
03.04 Prepare fish stocks.
03.05 Prepare roux and other thickening agents.
03.06 Prepare self-thickening soups.
03.07 Prepare cream soups.
03.08 Prepare chowders.
03.09 Prepare tomato sauce and derivatives.
03.10 Recognize soups and sauces by taste and appearance.
03.11 Prepare soup and sauce garnishes.
03.12 Present stocks, soups and sauces for serving.

04.0 DEMONSTRATE FRUIT AND VEGETABLES PREPARATION SKILLS--The student will be able to:

04.01 Identify and select fruits and vegetables.
04.02 Clean and store fruit and vegetables.
04.03 Peel and core fruit.
04.04 Peel vegetables by hand or machine.
04.05 Cut fruit and vegetables.
04.06 Zest citrus fruit.

04.07 Score citrus fruit.
04.08 Prepare fruit and vegetable garnishes.
04.09 Section fruit.
04.10 Puree fruit or vegetables.
04.11 Simmer, stew, or cream fruit and vegetables.
04.12 Broil fruit or vegetables.
04.13 Bake fruit and vegetables.
04.14 Braise fruit or vegetables.
04.15 Marinate and preserve fruit and vegetables.
04.16 Glaze fruit and vegetables.
04.17 Prepare processed fruits and vegetables.
04.18 Present fruit and vegetables for serving.

05.0 DEMONSTRATE MEAT, POULTRY, FISH, AND SEAFOOD PREPARATION SKILLS--The student will be able to:

05.01 Identify and select meat and poultry.
05.02 Handle and store meat and poultry.
05.03 Stew meats and poultry.
05.04 Boil meats and poultry.
05.05 Prepare, grind, and portion meats.
05.06 Select and determine doneness of meats.
05.07 Grill meats and poultry.
05.08 Broil meats and poultry.
05.09 Prepare garnishes for meat and poultry.
05.10 Portion meat and poultry.
05.11 Barbeque meats and poultry.
05.12 Deep fry meats and poultry.
05.13 Prepare stuffing/dressing.
05.14 Tenderize and marinate meats and poultry.
05.15 Break down animal carcasses.
05.16 Trim and bone meats and poultry.
05.17 Present meats and poultry for serving.
05.18 Bread or batter fish and seafood for cooking.
05.19 Select and prepare processed fish and seafood.
05.20 Deep fry fish or seafood.
05.21 Boil or steam seafood.
05.22 Grill or broil fish and seafood.
05.23 Present fish and seafood for serving.

06.0 DEMONSTRATE DAIRY, EGG, AND FARINACEOUS (STARCHY) PRODUCT PREPARATION SKILLS--The student will be able to:

06.01 Identify and select cheeses, milk, creams, and butter.
06.02 Identify and select farinaceous foods and cereals.
06.03 Store and handle farinaceous foods and cereals.
06.04 Prepare breakfast cereals.
06.05 Prepare and cook pancakes, griddle cakes, or waffles.
06.06 Store and handle fresh, frozen and cooked dairy products.
06.07 Store and handle eggs.
06.08 Boil eggs.
06.09 Fry eggs.
06.10 Scramble eggs.
06.11 Poach eggs.
06.12 Prepare omelets.
06.13 Reconstitute dairy or egg products.
06.14 Prepare egg batters.
06.15 Whip cream.
06.16 Select, break and separate eggs.
06.17 Prepare and cook pasta.
06.18 Select, prepare, and cook rice for specific dishes.
06.19 Produce stuffed or combined pasta.
06.20 Prepare eggs for binding and coating.
06.21 Present dairy, eggs and farinaceous products for serving.

07.0 DEMONSTRATE SALAD, BUFFET FOOD, BEVERAGE, AND RELATED FOOD PREPARATION SKILLS--The student will be able to:

07.01 Store and handle prepared cold food and beverages.
07.02 Reconstitute powdered beverages.
07.03 Prepare sandwich fillings.
07.04 Prepare greens for salads.
07.05 Prepare hot and cold beverages.

07.06 Select and extract juice from fruits and vegetables.
07.07 Prepare hot and cold sandwiches.
07.08 Prepare fruit salads and cocktails.
07.09 Prepare garnishes for salads and cold plates.
07.10 Prepare sliced meats for cold buffets.
07.11 Prepare vegetable salads.
07.12 Prepare farinaceous salads.
07.13 Prepare meat salads.
07.14 Prepare seafood or fish salads.
07.15 Set up and serve buffets.
07.16 Present salads, buffet foods and beverages for serving.

08.0 DEMONSTRATE BAKERY GOODS AND DESSERT PREPARATION SKILLS--The student will be able to:

08.01 Identify and select baking and dessert ingredients.
08.02 Store and handle baking and dessert products.
08.03 Prepare gelatins and puddings using mixes.
08.04 Prepare baked products using mixes.
08.05 Prepare basic pie dough.
08.06 Make and bake pies.
08.07 Prepare and bake quick breads.
08.08 Prepare and bake yeast dough.
08.09 Prepare basic cake batters.
08.10 Prepare syrups, sweet sauces and gelatins.
08.11 Prepare and apply butter creams and icings.
08.12 Prepare and bake butter sponge cake.
08.13 Prepare fruit fillings for pie and pastries.
08.14 Present bakery goods and desserts for serving.

09.0 DEMONSTRATE DINING ROOM OPERATIONS SKILLS--The student will be able to:

09.01 Handle guests with special needs-children, handicapped and elderly.
09.02 Show customers to table.
09.03 Answer telephones.
09.04 Set tables.
09.05 Prepare beverages.
09.06 Provide counter or snack bar service.
09.07 Present dessert menu.
09.08 Wipe spills.
09.09 Prepare for special events.
09.10 Transport prepared foods.
09.11 Replenish server service station.
09.12 Load and carry bussing tray.
09.13 Clear and re-set dining room tables.
09.14 Return unused condiments.
09.15 Store and maintain equipment for special needs.
09.16 Serve customers.
09.17 Package food and beverages.
09.18 Maintain supplies in counter area.
09.19 Maintain and clean counter area.

10.0 DEMONSTRATE A PROFICIENCY IN CUSTOMER RELATIONS--The student will be able to:

10.01 Greet customer in a hospitable manner.
10.02 Handle customer complaints in a positive professional manner.
10.03 Handle stressful situations.
10.04 Meet the needs of handicapped and special needs of customers (handicapped, children, elderly).
10.05 Recognize and cater to the personal needs of each customer through a positive, friendly dining room attitude.
10.06 Distinguish the importance of team work in establishing a pleasant dining room atmosphere.
10.07 Present a neat and clean appearance that will promote the image of the establishment in the customers opinion
10.08 Express gratitude for customers patronage and invite them to return.
10.09 Separate personal life from responsibility to work.
10.10 Identify attitudinal problems and discuss with management.
10.11 Sell and merchandise all menu items.
10.12 Project a positive attitude through words, smiles, body language, personality, etc.

10.13 React in all customer relations as though the "customer is always right."
10.14 Identify the advantages that will accrue through self-motivation such as advancement, increased salary and tips, better relations with customers, fellow employees and management.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrpreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Commercial Foods

PROGRAM NUMBER: 8763000

COURSE TITLE: Commercial Foods 1

COURSE NUMBER: 8763010

COURSE DESCRIPTION:

This course is designed to develop general housekeeping operation skills and equipment operation skills.

01.0 DEMONSTRATE GENERAL HOUSEKEEPING OPERATIONS SKILLS--The student will be able to:

01.01 Receive goods.
01.02 Store goods.
01.03 Distribute goods.
01.04 Clean storage and receiving areas.
01.05 Clean refrigerators and freezers.
01.06 Inventory goods.
01.07 Prepare daily food order.
01.08 Prepare work area.
01.09 Clean work area.
01.10 Store pots and pans.
01.11 Prepare dishwashing area.
01.12 Prepare dishware for washing.
01.13 Wash dishwares.
01.14 Clean dishwashing area.
01.15 Clean restrooms.
01.16 Clean floors.
01.17 Clean walls.
01.18 Clean filters.
01.19 Maintain clean and sanitary working area.
01.20 Read and follow equipment operating instructions.
01.21 Recognize and correct or report safety hazards.
01.22 Identify and select cleaning agents.

02.0 DEMONSTRATE EQUIPMENT OPERATION SKILLS--The student will be able to:

02.01 Select and use hand tools.
02.02 Operate beverage equipment.
02.03 Set, control, load and unload ovens for roasting.
02.04 Use pressure cookers and steam equipment.
02.05 Disassemble, clean, and reassemble kitchen equipment.
02.06 Operate microwave ovens.
02.07 Operate grinders and tenderizers.
02.08 Select, handle, and sharpen knives and other cutting tools.
02.09 Operate ranges, griddles, fryers, broilers, and toasters.
02.10 Operate proofers.
02.11 Operate mixers and blenders.
02.12 Operate slicing machines.
02.13 Set up and monitor food warmers.
02.14 Operate convection ovens.
02.15 Identify need for and report request tool and equipment repairs.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education

COURSE CREDIT: 1

PROGRAM TITLE: Commercial Foods

PROGRAM NUMBER: 8763000

COURSE TITLE: Commercial Foods 2

COURSE NUMBER: 8763020

COURSE DESCRIPTION:

This course is designed to develop skills in the preparation of fruit and vegetables, and salad, buffet food, and beverages.

04.0 DEMONSTRATE FRUIT AND VEGETABLES PREPARATION SKILLS--The student will be able to:

04.01 Identify and select fruits and vegetables.

04.02 Clean and store fruit and vegetables.
04.03 Peel and core fruit.
04.04 Peel vegetables by hand or machine.
04.05 Cut fruit and vegetables.
04.06 Zest citrus fruit.
04.07 Score citrus fruit.
04.08 Prepare fruit and vegetable garnishes.
04.09 Section fruit.
04.10 Puree fruit or vegetables.
04.11 Simmer, stew, or cream fruit and vegetables.
04.12 Broil fruit or vegetables.
04.13 Bake fruit and vegetables.
04.14 Braise fruit or vegetables.
04.15 Marinate and preserve fruit and vegetables.
04.16 Glaze fruit and vegetables.
04.17 Prepare processed fruits and vegetables.
04.18 Present fruit and vegetables for serving.

07.0 DEMONSTRATE SALAD, BUFFET FOOD, BEVERAGE, AND RELATED FOOD PREPARATION SKILLS--The student will be able to:

07.01 Store and handle prepared cold food and beverages.
07.02 Reconstitute powdered beverages.
07.03 Prepare sandwich fillings.
07.04 Prepare greens for salads.
07.05 Prepare hot and cold beverages.
07.06 Select and extract juice from fruits and vegetables.
07.07 Prepare hot and cold sandwiches.
07.08 Prepare fruit salads and cocktails.
07.09 Prepare garnishes for salads and cold plates.
07.10 Prepare sliced meats for cold buffets.
07.11 Prepare vegetable salads.
07.12 Prepare farinaceous salads.
07.13 Prepare meat salads.
07.14 Prepare seafood or fish salads.
07.15 Set up and serve buffets.
07.16 Present salads, buffet foods and beverages for serving.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1987
PROGRAM AREA:	Industrial Education	COURSE CREDIT:	1
PROGRAM TITLE:	Commercial Foods	PROGRAM NUMBER:	8763000
COURSE TITLE:	Commercial Foods 3	COURSE NUMBER:	8763030

COURSE DESCRIPTION:

This course is designed to develop proficiency in dining room operation skills and customer relations.

09.0 DEMONSTRATE DINING ROOM OPERATIONS SKILLS--The student will be able to:

09.01 Handle guests with special needs-children, handicapped and elderly.
09.02 Show customers to table.
09.03 Answer telephones.
09.04 Set tables.
09.05 Prepare beverages.
09.06 Provide counter or snack bar service.
09.07 Present dessert menu.
09.08 Wipe spills.
09.09 Prepare for special events.
09.10 Transport prepared foods.
09.11 Replenish server service station.
09.12 Load and carry bussing tray.
09.13 Clear and re-set dining room tables.
09.14 Return unused condiments.
09.15 Store and maintain equipment for special needs.
09.16 Serve customers.

09.17 Package food and beverages.
09.18 Maintain supplies in counter area.
09.19 Maintain and clean counter area.

10.0 DEMONSTRATE A PROFICIENCY IN CUSTOMER RELATIONS--The student will be able to:

10.01 Greet customer in a hospitable manner.
10.02 Handle customer complaints in a positive professional manner.
10.03 Handle stressful situations.
10.04 Meet the needs of handicapped and special needs of customers (handicapped, children, elderly).
10.05 Recognize and cater to the personal needs of each customer through a positive, friendly dining room attitude.
10.06 Distinguish the importance of team work in establishing a pleasant dining room atmosphere.
10.07 Present a neat and clean appearance that will promote the image of the establishment in the customers opinion.
10.08 Express gratitude for customers patronage and invite them to return.
10.09 Separate personal life from responsibility to work.
10.10 Identify attitudinal problems and discuss with management.
10.11 Sell and merchandise all menu items.
10.12 Project a positive attitude through words, smiles, body language, personality, etc.
10.13 React in all customer relations as though the "customer is always right."
10.14 Identify the advantages that will accrue through self-motivation such as advancement, increased salary and tips, better relations with customers, fellow employees and management.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education
COURSE CREDIT: 1

PROGRAM TITLE: Commercial Foods
PROGRAM NUMBER: 8763000

COURSE TITLE: Commercial Foods 4
COURSE NUMBER: 8763040

COURSE DESCRIPTION:

This course is designed to develop proficiency in stock, soup, and sauce preparation and meat, poultry, fish, and seafood preparation.

03.0 DEMONSTRATE STOCK, SOUP, AND SAUCE PREPARATION SKILLS--The student will be able to:

03.01 Prepare basic white stocks.
03.02 Store and handle stocks, soups, and sauces.
03.03 Prepare basic brown stocks.
03.04 Prepare fish stocks.
03.05 Prepare roux and other thickening agents.
03.06 Prepare self-thickening soups.
03.07 Prepare cream soups.
03.08 Prepare chowders.
03.09 Prepare tomato sauce and derivatives.
03.10 Recognize soups and sauces by taste and appearance.
3.11 Prepare soup and sauce garnishes.
03.12 Present stocks, soups and sauces for serving.

05.0 DEMONSTRATE MEAT, POULTRY, FISH, AND SEAFOOD PREPARATION SKILLS--The student will be able to:

05.01 Identify and select meat and poultry.
05.02 Handle and store meat and poultry.
05.03 Stew meats and poultry.
05.04 Boil meats and poultry.
05.05 Prepare, grind, and portion meats.
05.06 Select and determine doneness of meats.
05.07 Grill meats and poultry.
05.08 Broil meats and poultry.

05.09 Prepare garnishes for meat and poultry.
05.10 Portion meat and poultry.
05.11 Barbeque meats and poultry.
05.12 Deep fry meats and poultry.
05.13 Prepare stuffing/dressing.
05.14 Tenderize and marinate meats and poultry.
05.15 Break down animal carcasses.
05.16 Trim and bone meats and poultry.
05.17 Present meats and poultry for serving.
05.18 Bread or batter fish and seafood for cooking.
05.19 Select and prepare processed fish and seafood.
05.20 Deep fry fish or seafood.
05.21 Boil or steam seafood.
05.22 Grill or broil fish and seafood.
05.23 Present fish and seafood for serving.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1987
PROGRAM AREA:	Industrial Education	COURSE CREDIT:	1
PROGRAM TITLE:	Commercial Foods	PROGRAM NUMBER:	8763000
COURSE TITLE:	Commercial Foods 5	COURSE NUMBER:	8763050

COURSE DESCRIPTION:

This course is designed to develop proficiency in bakery goods, dessert preparation and dairy, egg, and farinaceous (starchy) product preparation.

06.0 DEMONSTRATE DAIRY, EGG, AND FARINACEOUS (STARCHY) PRODUCT PREPARATION SKILLS--The student will be able to:

06.01 Identify and select cheeses, milk, creams, and butter.
06.02 Identify and select farinaceous foods and cereals.
06.03 Store and handle farinaceous foods and cereals.
06.04 Prepare breakfast cereals.
06.05 Prepare and cook pancakes, griddle cakes, or waffles.
06.06 Store and handle fresh, frozen and cooked dairy products.
06.07 Store and handle eggs.
06.08 Boil eggs.
06.09 Fry eggs.
06.10 Scramble eggs.
06.11 Poach eggs.
06.12 Prepare omelets.
06.13 Reconstitute dairy or egg products.
06.14 Prepare egg batters.
06.15 Whip cream.
06.16 Select, break and separate eggs.
06.17 Prepare and cook pasta.
06.18 Select, prepare, and cook rice for specific dishes.
06.19 Produce stuffed or combined pasta.
06.20 Prepare eggs for binding and coating.
06.21 Present dairy, eggs and farinaceous products for serving.

08.0 DEMONSTRATE BAKERY GOODS AND DESSERT PREPARATION SKILLS--The student will be able to:

08.01 Identify and select baking and dessert ingredients.
08.02 Store and handle baking and dessert products.
08.03 Prepare gelatins and puddings using mixes.
08.04 Prepare baked products using mixes.
08.05 Prepare basic pie dough.
08.06 Make and bake pies.
08.07 Prepare and bake quick breads.
08.08 Prepare and bake yeast dough.
08.09 Prepare basic cake batters.
08.10 Prepare syrups, sweet sauces and gelatins.
08.11 Prepare and apply butter creams and icings.
08.12 Prepare and bake butter sponge cake.
08.13 Prepare fruit fillings for pie and pastries.
08.14 Present bakery goods and desserts for serving.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1987
PROGRAM AREA:	Industrial Education	COURSE CREDIT:	1
PROGRAM TITLE:	Commercial Foods	PROGRAM NUMBER:	8763000
COURSE TITLE:	Commercial Foods 6	COURSE NUMBER:	8763060

COURSE DESCRIPTION:

This course is designed to develop employability and entrepreneurship skills.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrpreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK | PROGRAM AREA: Industrial
FLORIDA DEPARTMENT OF EDUCATION | EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Commercial Foods and Culinary Arts

CODE NUMBER: Secondary ___ Postsecondary HFT0190
Florida CIP IN20.040300

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational
___ Postsecondary Vocational x Other 13 - 17

CERTIFICATION COVERAGE: COMM COOK @ 7 COMM BAKER @ 7
QUAN FOOD 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as chef/cook (313.131-014), baker and pastry maker (313.381-026), beverage maker (317.684-010), dessert maker (313.361-014), entree cook (313.361-014), fryer and griddle cook (313.361-022), salad maker (317.684-014), sandwich maker (317.684-014), soup and sandwich (313.361-022), fruit and vegetable cook (313.361-014), cook's helper (317.687-010), manager/supervisor (187.167-106), host or hostess/cashier (310.137-010), water/waitress/cafeteria line worker (311.677-010, utility worker/bus person (311.677-018).

II. LABORATORY ACTIVITIES: Kitchen or food preparation and serving laboratory activities are an integral part of this program, and include identification, storage, selection, preparation and presentation of a wide varietry of foods commensurate with student goals and training specializations.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communications, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher, and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 contact hours (2160 clock hours).

IV. INTENDED OUTCOMES: After successfuly completing this program the student will be able to:

01. Demonstrate proficiency in general housekeeping operations.
02. Demonstrate proficiency in stock, soup, and sauce preparation skills.
03. Demonstrate proficiency in fruit and vegetables preparation skills.
04. Demonstrate proficiency in meat, poultry, fish, and seafood preparation skills.
05. Demonstrate proficiency in dairy, egg, and farinaceous (starchy) product preparation skills.
06. Demonstrate proficiency in salad, buffet food, beverage, and related food preparation skills.
07. Demonstrate proficiency in bakery goods and dessert preparation skills.
08. Demonstrate proficiency in dining room operations skills.
09. Demonstrate proficiency in planning, organizing and implementing work.
10. Demonstrate proficiency in employability skills.
11. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial SECONDARY NUMBER ____________
PROGRAM TITLE: Commercial Foods and Culinary Art PROGRAM NUMBER: HFT0190

01.0 DEMONSTRATE GENERAL HOUSEKEEPING OPERATIONS SKILLS--The student will be able to:

01.01 Receive goods.
01.02 Store goods.
01.03 Distribute goods.
01.04 Clean storage and receiving areas.
01.05 Clean refrigerators and freezers.
01.06 Inventory goods.
01.07 Prepare daily food order.
01.08 Prepare work area.
01.09 Clean work area.
01.10 Store pots and pans.
01.11 Prepare dishwashing area.
01.12 Prepare dishware for washing.
01.13 Wash dishwares.
01.14 Clean dishwashing area.
01.15 Clean restrooms.
01.16 Clean floors.
01.17 Clean walls.
01.18 Clean filters.
01.19 Select and use hand tools.
01.20 Maintain clean and sanitary working area.
01.21 Read and follow equipment operating instructions.
01.22 Recognize and correct or report safety hazards.
01.23 Operate beverage equipment.
01.24 Set, control, load and unload ovens for roasting.
01.25 Use pressure cookers and steam equipment.
01.26 Identify and select cleaning agents.
01.27 Disassemble, clean, and reassemble kitchen equipment.
01.28 Operate microwave ovens.
01.29 Operate grinders and tenderizers.
01.30 Select, handle, and sharpen knives and other cutting tools.
01.31 Operate ranges, griddles, fryers, broilers, and toasters.
01.32 Operate proofers.
01.33 Operate mixers and blenders.
01.34 Operate slicing machines.
01.35 Set up and monitor food warmers.
01.36 Operate power cutters, shredders and peelers.
01.37 Operate tilting quantity equipment.
01.38 Operate convection ovens.
01.39 Operate saws.
01.40 Identify need for and report request tool and equipment repairs.

02.0 DEMONSTRATE STOCK, SOUP, AND SAUCE PREPARATION SKILLS--The student will be able to:

02.01 Reconstitute powdered soups and sauces.
02.02 Prepare basic white stocks.
02.03 Store and handle stocks, soups, and sauces.
02.04 Prepare basic brown stocks.
02.05 Prepare fish stocks.
02.06 Bind soups, sauces and stocks.
02.07 Prepare roux and other thickening agents.
02.08 Prepare self-thickening soups.
02.09 Prepare cream soups.
02.10 Prepare chowders.
02.11 Prepare bechamel sauces and derivatives.
02.12 Prepare espagnole and demi-glace sauces and derivatives.
02.13 Make jus and glace de viande.
02.14 Prepare veloutes and derivatives.
02.15 Prepare tomato sauce and derivatives.
02.16 Recognize soups and sauces by taste and appearance.
02.17 Prepare soup and sauce garnishes.
02.18 Prepare cold soups.
02.19 Prepare mustard, curry and other non-derivative sauces.

02.20 Prepare emulsions.
02.21 Clarify stocks.
02.22 Prepare clear soups.
02.23 Prepare bisque and other specialty soups.
02.24 Prepare hollandaise and derivatives.
02.25 Prepare mayonaisse and derivatives.
02.26 Present stocks, soups and sauces for serving.

03.0 DEMONSTRATE FRUIT AND VEGETABLES PREPARATION SKILLS--The student will be able to:

03.01 Identify and select fruits and vegetables.
03.02 Clean and store fruit and vegetables.
03.03 Peel and core fruit.
03.04 Peel vegetables by hand or machine.
03.05 Cut fruit and vegetables.
03.06 Zest citrus fruit.
03.07 Score citrus fruit.
03.08 Prepare fruit and vegetable garnishes.
03.09 Section fruit.
03.10 Bread and batter fruit and vegetables.
03.11 Puree fruit and vegetables.
03.12 Simmer, stew, or cream fruit and vegetables.
03.13 Blanche fruit and vegetables.
03.14 Stuff fruit and vegetables.
03.15 Deep fry fruit and vegetables.
03.16 Saute fruit and vegetables.
03.17 Broil fruit and vegetables.
03.18 Bake fruit and vegetables.
03.19 Braise fruit and vegetables.
03.20 Marinate and preserve fruit and vegetables.
03.21 Glaze fruit and vegetables.
03.22 Turn vegetables.
03.23 Select, prepare, turn, and cook mushrooms.
03.24 Prepare processed fruits and vegetables.
03.25 Identify, select, and prepare nuts.
03.26 Present fruit and vegetables for serving.

04.0 DEMONSTRATE MEAT, POULTRY, FISH, AND SEAFOOD PREPARATION SKILLS--The student will be able to:

04.01 Identify and select meat and poultry.
04.02 Handle and store meat and poultry.
04.03 Stew meats and poultry.
04.04 Boil meats and poultry.
04.05 Poach meats and poultry.
04.06 Saute meats and poultry.
04.07 Prepare, grind, and portion meats.
04.08 Select and determine doneness of meats.
04.09 Grill meats and poultry.
04.10 Broil meats and poultry.
04.11 Identify types and cuts of meat.
04.12 Blanche meat and poultry.
04.13 Clean and tie poultry and meat.
04.14 Prepare garnishes for meat and poultry.
04.15 Portion meat and poultry.
04.16 Slice and carve meat and poultry.
04.17 Barbeque meats and poultry.
04.18 Deep fry meats and poultry.
04.19 Bake or roast meat and poultry.
04.20 Braise meats and poultry.
04.21 Prepare stuffing/dressing.
04.22 Stuff meats and poultry.
04.23 Prepare and cook force meat.
04.24 Lard, bard, and piquer meats and poultry.
04.25 Prepare jellied meats.
04.26 Tenderize and marinate meats and poultry.
04.27 Break down animal carcasses.
04.28 Trim and bone meats and poultry.
04.29 Present meats and poultry for serving.
04.30 Identify and select fish and seafoods.

04.31 Clean and wash fish.
04.32 Scale fish.
04.33 Peel and devein soft shellfish.
04.34 Bread or batter fish and seafood for cooking.
04.35 Store and handle fresh, frozen and cooked fish and seafood.
04.36 Select and prepare processed fish and seafood.
04.37 Split and crack lobster and other crustaceans.
04.38 Prepare whole fish for baking.
04.39 Prepare fish for stuffing.
04.40 Stew fish and seafood.
04.41 Cut, skin and fillet fish.
04.42 Deep fry fish or seafood.
04.43 Saute fish and seafood.
04.44 Poach fish and seafood.
04.45 Boil or steam seafood.
04.46 Braise fish and seafood.
04.47 Grill or broil fish and seafood.
04.48 Prepare snails (escargot).
04.49 Marinate fish and seafoods.
04.50 Open and shuck oysters, clams, and mussels.
04.51 Prepare and cook frog legs.
04.52 Stuff fish or seafood.
04.53 Mount fish and seafood for cooking.
04.54 Prepare specialty fish and seafoods (turtle, eel, squid, octupus, etc.).
04.55 Present fish and seafood for serving.

05.0 DEMONSTRATE DAIRY, EGG, AND FARINACEOUS (STARCHY) PRODUCT PREPARATION SKILLS--The student will be able to:

05.01 Identify and select cheeses, milk, creams, and butter.
05.02 Identify and select farinaceous foods and cereals.
05.03 Store and handle farinaceous foods and cereals.
05.04 Prepare breakfast cereals.
05.05 Prepare and cook pancakes, griddle cakes and waffles.
05.06 Store and handle fresh, frozen and cooked dairy products.
05.07 Store and handle eggs.
05.08 Boil eggs.
05.09 Fry eggs.
05.10 Scramble eggs.
05.11 Poach eggs.
05.12 Prepare omelets.
05.13 Reconstitute dairy and egg substitutes.
05.14 Prepare egg batters.
05.15 Whip cream.
05.16 Select, break and separate eggs.
05.17 Shirr eggs.
05.18 Prepare cold or hot stuffed eggs.
05.19 Prepare hot and cold butters.
05.20 Prepare and cook pasta.
05.21 Select, prepare, and cook rice for specific dishes.
05.22 Produce stuffed or combined pasta.
05.23 Prepare eggs for binding and coating.
05.24 Prepare cream and cheese dressings, spreads and fillings.
05.25 Prepare custards and cream fillings.
05.26 Prepare and cook crepes.
05.27 Prepare eggs for garnish and aspics.
05.28 Prepare dumplings.
05.29 Prepare souffles.
05.30 Present dairy, eggs and farinaceous products for serving.

06.0 DEMONSTRATE SALAD, BUFFET FOOD, BEVERAGE, AND RELATED FOOD PREPARATION SKILLS--The student will be able to:

06.01 Store and handle prepared cold food and beverages.
06.02 Reconstitute powdered beverages.
06.03 Prepare sandwich fillings.
06.04 Prepare greens for salads.
06.05 Prepare hot and cold beverages.
06.06 Select and extract juice from fruits and vegetables.
06.07 Prepare hot and cold sandwiches.

06.08 Prepare fruit salads and cocktails.
06.09 Prepare garnishes for salads and cold plates.
06.10 Prepare seafood cocktails.
06.11 Prepare sliced meats for cold buffets.
06.12 Prepare vegetable salads.
06.13 Prepare farinaceous salads.
06.14 Prepare meat salads.
06.15 Prepare seafood and fish salads.
06.16 Prepare salad dressings, cold sauces and derivatives.
06.17 Prepare cheese boards.
06.18 Prepare canapes and cold hors d'oeuvres.
06.19 Prepare hot hors d'oeuvres.
06.20 Prepare jellies and aspics.
06.21 Mount or mold meat and poultry.
06.22 Chemiser (coat), decorate, mold and serve buffets.
06.23 Set up and serve buffets.
06.24 Prepare fondues.
06.25 Prepare mousses.
06.26 Produce fat and ice sculptures.
06.27 Select, use and maintain buffet equipment and utensils.
06.28 Present salads, buffet foods and beverages for serving.

07.0 DEMONSTRATE BAKERY GOODS AND DESSERT PREPARATION SKILLS--The student will be able to:

07.01 Identify and select baking and dessert ingredients.
07.02 Store and handle baking and dessert products.
07.03 Prepare gelatins and puddings using mixes.
07.04 Prepare baked products using mixes.
07.05 Prepare basic pie dough.
07.06 Make and bake pies.
07.07 Prepare and bake quick breads.
07.08 Prepare and bake yeast dough.
07.09 Prepare basic cake batters.
07.10 Prepare syrups, sweet sauces and gelatins.
07.11 Prepare and apply butter creams and icings.
07.12 Prepare short paste products and cookies.
07.13 Prepare and cook donuts and other sweet yeast products.
07.14 Prepare and bake butter sponge.
07.15 Prepare fruit fillings for pie and pastries.
07.16 Prepare and bake choux paste.
07.17 Produce basic pastry creams and Bavarian types.
07.18 Prepare and bake pate a baba.
07.19 Prepare and bake pate a brioche.
07.20 Decorate pastry cakes and desserts.
07.21 Prepare parfaits, bombes and coupes.
07.22 Prepare and bake puff pastry.
07.23 Prepare steam puddings.
07.24 Prepare chiffons.
07.25 Prepare and bake meringues.
07.26 Present bakery goods and desserts for serving.

08.0 DEMONSTRATE DINING ROOM OPERATIONS SKILLS--The student will be able to:

08.01 Supervise serving staff.
08.02 Supervise appearance of dining room.
08.03 Greet customers.
08.04 Handle guests with special needs - children, handicapped and elderly.
08.05 Show customers to table.
08.06 Supervise guest comfort.
08.07 Answer telephones.
08.08 Take reservations.
08.09 Set tables.
08.10 Prepare beverages.
08.11 Provide counter or snack bar service.
08.12 Present dessert menu.
08.13 Wipe spills.
08.14 Prepare for special events.
08.15 Transport prepared foods.
08.16 Replenish server service station.

08.17 Load and carry bussing tray.
08.18 Clear and re-set dining room tables.
08.19 Return unused condiments.
08.20 Store and maintain equipment for special needs.
08.21 Operate cash register.
08.22 Record sales breakdown.
08.23 Balance cash register.
08.24 Serve customers.
08.25 Package food and beverages.
08.26 Maintain supplies in counter area.
08.27 Maintain and clean counter area.
08.28 Set up cafeteria line.
08.29 Display food and beverages.
08.30 Serve and replenish food items.
08.31 Close down cafeteria line.
08.32 Recruit and select employees.
08.33 Orient new employees.
08.34 Train employees.
08.35 Promote professionalism among employees.
08.36 Comply with local, state and federal regulations.
08.37 Calculate and schedule man hours for employees.
08.38 Handle customer complaints.
08.39 Perform bookkeeping duties.
08.40 Calculate ingredient costs selling price.
08.41 Develop and implement merchandising strategy.
08.42 Determine food and beverage requirements.
08.43 Purchase food and beverages.
08.44 Order supplies and equipment.
08.45 Bill customers.

09.0 PLAN, ORGANIZE AND IMPLEMENT WORK--The student will be able to:

09.01 Direct and monitor operation of meal assembly lines.
09.02 Rotate foods.
09.03 Conserve excess foods.
09.04 Prepare requisitions.
09.05 Write reports.
09.06 Communicate and coordinate work with relate operations.
09.07 Take inventory.
09.08 Organize work station.

10.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

10.01 Conduct a job search.
10.02 Secure information about a job.
10.03 Identify documents which may be required when applying for a job interview.
10.04 Complete a job application form correctly.
10.05 Demonstrate competence in job interview techniques.
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
10.07 Identify acceptable work habits.
10.08 Demonstrate knowledge of how to make job changes appropriately.
10.09 Demonstrate acceptable employee health habits.

11.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

11.01 Define entrepreneurship.
11.02 Describe the importance of entrepreneurship to the American economy
11.03 List the advantages and disadvantages of business ownership.
11.04 Identify the risks involved ownership of a business.
11.05 Identify the necessary personal characteristics of a successful entrpreneur.
11.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Commercial Photography

CODE NUMBER: Secondary ______ Postsecondary GRA0997

Florida CIP IN48.020400

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-17

CERTIFICATION COVERAGE: PHOTOG 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as photographers (10221801), photoengravers (50101003), photographic process workers (61084400), photographer's assistants, photographer's helpers (976.667-010), photo print finishers (143.382-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the use of cameras and laboratory film-processing techniques in portrait, commercial and industrial applications with emphasis on composition and color dynamics, contact printing, enlarging and developing film, and use, care, and maintenance of photographic equipment.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the tools, equipment, materials and processes used in the photography programs should be similar to those used in industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The typical length of this program for the average achieving student is 1600 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform laboratory skills.
02. Control exposures (35mm camera).
03. Take basic photographs (35mm camera).
04. Operate various format camera.
05. Finish photographs.
06. Apply lighting techniques.
07. Take studio photographs.
08. Reproduce photographic media.

09. Process color film.
10. Print color photographs.
11. Produce media presentations.
12. Manage a photographic business.
13. Demonstrate employability skills.
14. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education
SECONDARY NUMBER: ________

PROGRAM TITLE: Commercial Photography
POSTSECONDARY NUMBER: GRA0997

01.0 PERFORM LABORATORY SKILLS--The student will be able to:

01.01 Mix developers and other chemicals.
01.02 Hand-process black and white film.
01.03 Print black and white photographs.
01.04 Process black and white paper.

02.0 CONTROL EXPOSURES (35mm CAMERA)--The student will be able to:

02.01 Set appropriate f-stops and shutter speeds.
02.02 Select appropriate film type.

03.0 TAKE BASIC PHOTOGRAPHS (35mm CAMERA)--The student will be able to:

03.01 Apply camera care and maintenance principles.
03.02 Compose photographs.
03.03 Take still photographs.
03.04 Take action photographs.

04.0 OPERATE VARIOUS FORMAT CAMERAS--The student will be able to:

04.01 Use 2¼ format camera.
04.02 Use view cameras.

05.0 FINISH PHOTOGRAPHS--The student will be able to:

05.01 Mount photographs.
05.02 Mat/frame photographs.

06.0 APPLY LIGHTING TECHNIQUES--The student will be able to:

06.01 Take photographs with available light.
06.02 Take photographs with electronic strobe.
06.03 Take photographs with photo-flood lighting.

07.0 TAKE STUDIO PHOTOGRAPHS--The student will be able to:

07.01 Take commercial photographs.
07.02 Take portraits.

08.0 REPRODUCE PHOTOGRAPHIC MEDIA--The student will be able to:

08.01 Copy prints.
08.02 Copy transparencies.
08.03 Make internegatives.

09.0 PROCESS COLOR FILM--The student will be able to:

09.01 Hand process color negatives and transparencies.
09.02 Process color negatives and transparencies.

10.0 PRINT COLOR PHOTOGRAPHS--The student will be able to:

10.01 Process color paper.
10.02 Print color negatives.
10.03 Print color negatives using color analyzer.

11.0 PRODUCE MEDIA PRESENTATIONS--The student will be able to:

11.01 Prepare script for slide presentation.
11.02 Shoot slides for slide presentation.
11.03 Produce slide presentation.
11.04 Prepare script for video presentation.
11.05 Shoot video tape.
11.06 Produce video presentation.

12.0 MANAGE THE PHOTOGRAPHIC BUSINESS--The student will be able to:

12.01 Apply communication skills.
12.02 Apply human relation skills.
12.03 Set rates for photographic work.

12.04 Maintain shop records and files.
12.05 Develop effective advertising.
12.06 Maintain presentational portfolio.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

13.01 Conduct a job search.
13.02 Secure information about a job.
13.03 Identify documents which may be required when applying for a job interview.
13.04 Complete a job application form correctly.
13.05 Demonstrate competence in job interview techniques.
13.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
13.07 Identify acceptable work habits.
13.08 Demonstrate knowledge of how to make job changes appropriately.
13.09 Demonstrate acceptable employee health habits.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship.
14.02 Describe the importance of entrepreneurship to the American economy.
14.03 List the advantages and disadvantages of business ownership.
14.04 Identify the risks involved in ownership of a business.
14.05 Identify the necessary personal characteristics of a successful entrepreneur.
14.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Commercial Vehicle Driving

CODE NUMBER: Secondary _______ Postsecondary TRA0801

Florida CIP IN49.020500

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ________

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

_____ Postsecondary Vocational x Other 13-15

CERTIFICATION COVERAGE: COMM DRIV 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as truck drivers (62002201), tractor-trailer-truck drivers (904.383-010) and heavy truck drivers (905.663-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, operation of large semi truck tractor vehicles, loading and unloading cargo, reporting delays or accidents on the road, verifying load against shipping papers and keeping records.

II. LABORATORY ACTIVITIES: Shop or driving range activities are an integral part of this program and provide instruction in loading, backing and manuevering both on a practice field and on public roads and highways with other traffic.

III. SPECIAL NOTE: Students completing this program must exhibit a safe driving record and be at least 21 years of age to comply with Florida Department of Transportation requirements.

If this program is 450 hours or longer, in accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 320 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Describe vehicle safety and accident prevention procedures.
02. Comply with vehicle operating regulations.
03. Demonstrate proper cargo handling and documentation procedures.
04. Demonstrate pre-trip preparation procedures.
05. Demonstrate vehicle inspection procedures..
06. Perform vehicle maintenance and servicing procedures.
07. Demonstrate basic vehcile control procedures.
08. Demonstrate backing, coupling and uncoupling skills.
09. Demonstrate basic vehcile maneuvers.
10. Demonstrate road driving skills.
11. Describe hazardous driving skills.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — SECONDARY NUMBER

PROGRAM TITLE: Commercial Vehicle Driving — PROGRAM NUMBER: TRA0801

01.0 DESCRIBE VEHICLE SAFETY & ACCIDENT PREVENTION PROCEDURES--The student will be able to:

01.01 Identify & explain the use of vehicle safety equipment.
01.02 Explain the use of fire extinguishers & fire fighting procedures.
01.03 Utilize seat belts & personal protection gear appropriate to type of operation.
01.04 Describe safe lifting procedures.
01.05 Describe personal safety equipment & procedures.
01.06 Describe actions applicable for vehicle accidents.
01.07 Describe accident reporting requirements (Company-State-Fed).
01.08 Identify all information needed for accident reports to the State, the employer, & the insurance company.
01.09 Describe procedures for protecting the scene of an accident.
01.10 Identify types of hazardous cargos.
01.11 Describe personal liability requirements.
01.12 Identify hazardous road conditions that are a potential threat to the safety of the tractor-trailer driver.
01.13 Describe activities & characteristics of other road users that make them potentially dangerous.
01.14 Describe the potential consequences of excessive speed.
01.15 Describe the potential consequences of use of drugs or alcohol.

02.0 COMPLY WITH VEHICLE OPERATING REGULATIONS--The student will be able to:

02.01 Comply with hours of service regulations.
02.02 Maintain a complete, neat, & accurate driver's duty status log.
02.03 Keep accurate records required by hours of service regulations.
02.04 Perform mathematical calculations necessary to recap and apply totals to the hours of service regulations.
02.05 Determine driving hours remaining on a particular day or tour of duty.
02.06 Comply with applicable Department of Transportation regulations.
02.07 Comply with Florida Public Safety Commission regulations.
02.08 Comply with Interstate Commerce Commission regulations.
02.09 Comply with City & State traffic laws.
02.10 Comply with State & local law restrictions on vehicle size and weight.
02.11 Identify permit requirements.

03.0 DEMONSTRATE PROPER CARGO HANDLING AND DOCUMENTATION PROCEDURES--The student will be able to:

03.01 Load & unload cargo safely & efficiently.
03.02 Obtain gross weight & axle weight.
03.03 Distribute cargo load to meet legal weight & safety requirements.
03.04 Secure cargo using blocking, bracing, packing, stacking, & rope, cable, chains & straping.
03.05 Mount placards when carrying hazardous materials.
03.06 Describe procedure for use of common cargo handling equipment, including pallets, jacks, dollies, handtrucks, forklift trucks, nets, slings, poles, & other equipment.
03.07 Identify categories of hazardous materials & the need for specialized training to handle hazardous materials.
03.08 Identify hazardous materials documentation requirements.

03.09 Verify nature, amount, & condition of cargo on both pickup & delivery.
03.10 Verify information on bill of lading & properly record & report discrepancies & damage to the cargo.
03.11 Obtain appropriate signatures on delivery receipts & other required forms.
03.12 Properly prepare a manifest.
03.13 Properly handle C.O.D. shipments.
03.14 Verify door seal number against shipping document.
03.15 Comply with Port of Entry or Exit & other inspection station procedures.

04.0 DEMONSTRATE PRE-TRIP PREPARATION PROCEDURES--The student will be able to:

04.01 Check & secure tractor trailer or vehicle permit.
04.02 Check for accident reports packet.
04.03 Plan a route from one point to another that is optimal in terms of travel time, fuel costs, potential hazards, & Federal, State & local travel restrictions.
04.04 Arrange to secure permits required by the nature of the vehicle, its cargo, & route to be traveled.
04.05 Arrange a secure place for vehicle on layovers, especially when transporting hazardous materials.
04.06 Demonstrate map reading skills.
04.07 Estimate travel time & plan rest stops & layovers.
04.08 Estimate fuel consumption & plan fuel stops
04.09 Estimate expense money & obtain funds &/or credit cards

05.0 DEMONSTRATE VEHICLE INSPECTION PROCEDURES--The student will be able to:

05.01 Check general appearance & condition of vehicle.
05.02 Check fuel, oil, & water levels.
05.03 Check signal lights, stop lights & running lights.
05.04 Check tires, rims, & suspension.
05.05 Check horn, windshield wipers, mirrors, & reflectors.
05.06 Check fifth wheel, trailer hook up & brake lines.
05.07 Check emergency flares & fire extinguishers.
05.08 Check instruments for normal readings.
05.09 Check steering system, brake action, & tractor protection valve.
05.10 Check cargo blocking, bracing, & tie down.
05.11 Perform enroute inspections of mirrors, instrument panel engine & power train, suspension system, & brakes.
05.12 Perform post-trip inspection of vehicle & all systems.

06.0 PERFORM VEHICLE MAINTENANCE AND SERVICING PROCEDURES--The student will be able to:

06.01 Describe function & operation of key vehicle systems, engine, engine auxiliary systems, brakes, drive train, coupling systems, suspension, electrical system, etc..
06.02 Service engine fuel, oil, coolant, battery, & filters.
06.03 Check tire air pressure.
06.04 Change wheels (with tires mounted) & check for proper tire & wheel mounting.
06.05 Drain moisture from air brake supply reservoirs & fuel.
06.06 Check & adjust brakes.
06.07 Clean & repair lights.
06.08 Change fuses & reset circuit breakers.
06.09 Replace fan & alternator belts .
06.10 Clean interior & exterior of vehicle.
06.11 Check & replace mud/rain flaps .
06.12 Check & adjust CB radio if so equipped .
06.13 Check & adjust Tandum & Fifth-wheel slides if so equipped .

07.0 DEMONSTRATE BASIC VEHICLE CONTROL PROCEDURES--The student will be able to:

07.01 Place transmission in neutral before starting engine.
07.02 Start, warm up, & shut down the engine, according to the manufacturers specifications.
07.03 Build full pressure (90-120 PSI) in air tanks before starting.
07.04 Test parking break & service break before starting.
07.05 Coordinate use of accelerator & clutch to achieve smooth acceleration & avoid clutch abuse.
07.06 Maintain proper engine RPM while driving.
07.07 Properly modulate air brakes to bring vehicle to a smooth stop.
07.08 Shift up & down through all gears of all major types of conventional transmissions, including auxiliary transmissions & multispeed axles.
07.09 Double clutch & time shift for smooth & fuel-efficient performance.
07.10 Select proper gear for speed & highway conditions.
07.11 Operate automatic & semiautomatic transmissions.
07.12 Coordinate steering, braking, & acceleration to take the vehicle through a desired path forward & to back in a straight line.
07.13 Adequately judge the path trailer will take (off-tracking) as vehicle negotiates left or right curves & turns.
07.14 Use clutch & gears to slow vehicle.
07.15 Park the vehicle, set brakes, & shut off the engine.
07.16 Properly chock/block wheels.

08.0 DEMONSTRATE BACKING, COUPLING AND UNCOUPLING SKILLS--The student will be able to:

08.01 Check area before backing.
08.02 Properly utilize guides & mirrors.
08.03 Properly back in straight line & curved paths.
08.04 Properly back into an alley dock.
08.05 Properly parallel park.
08.06 Park in a jackknife position.
08.07 Judge side, rear, and overhead clearances and path of the trailer.
08.08 Apply the principles of reverse-steering an articulated vehicle.
08.09 Align the tractor properly to connect with trailer.
08.10 Secure the trailer against movement.
08.11 Back the tractor properly into the trailer kingpin without damage.
08.12 Perform mechanical and visual checks to make sure coupling is secure.
08.13 Connect electrical and air lines properly.
08.14 Set in-cab air brake controls properly.
08.15 Retract and secure landing gear after coupling is secure.
08.16 Properly uncouple and secure the trailer.

09.0 DEMONSTRATE BASIC VEHICLE MANEUVERS--The student will be able to:

09.01 Demonstrate ability to make a straight in approach to an alley.
09.02 Demonstrate ability to drive forward through an alley for 100'.
09.03 Demonstrate ability to properly stop the unit within 12" of the end of the alley.
09.04 Demonstrate ability to back 100' through an alley.
09.05 Demonstrate ability to properly stop the unit within 12" of the end of the alley.
09.06 Demonstrate ability to make proper straight in approach to multiple curves (serpentine).
09.07 Demonstrate ability to drive forward through curves (serpentine) while keeping tires inside of line.
09.08 Demonstrate ability to properly position unit for backing into a loading dock.

09.09 Demonstrate ability to properly back to a dock.
09.10 Demonstrate ability to properly stop unit within 12" of the dock without contacting dock.
09.11 Demonstrate ability to properly enter a weighing platform.

10.0 DEMONSTRATE ROAD DRIVING SKILLS--The student will be able to:

10.01 Carefully enter traffic from parked position.
10.02 Use clutch & gears properly.
10.03 Start without rolling backward.
10.04 Use mirrors properly.
10.05 Signal intention to turn well in advance.
10.06 Get into proper lane well in advance of turn.
10.07 Check traffic conditions & turn only when intersection is clear.
10.08 Restrict traffic from passing on right when preparing to complete a right hand turn.
10.09 Complete a turn promptly & safely & do not impede other traffic.
10.10 Select & shift to proper gear prior to beginning any turn.
10.11 Obey all traffic signals.
10.12 Plan stop in advance & adjust speed correctly.
10.13 Use brakes properly on grades.
10.14 Plan stop far enough in advance to avoid hard braking.
10.15 Stop clear of crosswalks.
10.16 Come to a complete stop at all stop signs.
10.17 Yield right of way at intersections having yield signs.
10.18 Check for cross traffic regardless of traffic signals.
10.19 Enter all intersections prepared to stop if necessary.
10.20 Stop at a minimum of fifteen feet but not more than fifty feet before railroad grade crossing if stop is necessary.
10.21 Select proper gear & do not shift gears on railroad grade crossing.
10.22 Allow sufficient space ahead for passing.
10.23 Pass only in safe locations.
10.24 Pass on two-lane highway.
10.25 Pass on four or more lane highway.
10.26 Signal changing lanes before & after passing.
10.27 Warn driver ahead of intention to pass.
10.28 Pass only when appropriate to avoid impeding other traffic.
10.29 Return to right lane promptly but only when safe to do so.
10.30 Observe speed limits.
10.31 Adjust speed properly to road, weather, & traffic conditions.
10.32 Slow down in advance of curves, danger zones, & intersections.
10.33 Maintain consistent speed where possible.
10.34 Yield right of way.
10.35 Allow faster traffic to pass.
10.36 Use horn only when necessary.
10.37 Park only in legally attained parking areas.
10.38 Check instruments at regular intervals.
10.39 Maintain proper engine RPM while driving.

11.0 DEMONSTRATE HAZARDOUS DRIVING SKILLS--The student will be able to:

11.01 Describe preparation for operation in cold weather, including activating the front brake limiting valve; removing snow & ice from windows, mirrors, brakes, lights, hand & toe holds, etc; & installing tire chains when necessary.
11.02 Demonstrate proper procedure for expelling moisture from the air tanks after each trip.
11.03 Describe proper procedure for checking ice accumulation on brakes, slack adjuster, air hoses, electrical wiring & radiator shutters during operation.
11.04 Describe adjustments to operation of vehicle for weather conditions, including speed selection, braking, direction changes & following distance, to maintain control & avoid jackknifing.

11.05 Describe procedures to check safe operation of brakes after driving through deep water.
11.06 Perform proper use of windshield wipers, washers, & defrosters to maintain visibility.
11.07 Demonstrate ability for observing road surface for changes in conditions.
11.08 Demonstrate ability for recognizing conditions that produce low traction, including initial rainfall, ice, snow & mud.
11.09 Describe procedures to avoid skidding & jackknifing.
11.10 Describe procedures to avoid hydroplaning & the road & vehicle conditions that produce it.
11.11 Describe procedures for mounting & dismounting tire chains.
11.12 Describe procedures for extricating the vehicle from snow, sand & mud by maneuvering or towing.
11.13 Demonstrate ability to adjust rate of change in speed & direction to road conditions to avoid skidding.
11.14 Demonstrate ability to coordinate acceleration & shifting to overcome the resistance of snow, sand & mud.
11.15 Demonstrate ability to perform checks on brake adjustment prior to mountain driving.
11.16 Demonstrate ability to use right lane or special truck lane going up grades.
11.17 Demonstrate ability to place transmission in appropriate gear for engine braking before starting downgrade.
11.18 Demonstrate ability to use proper braking techniques & maintain proper engine braking before starting downgrades.
11.19 Describe proper use of truck escape ramp, if available, when brakes fail on a downgrade.
11.20 Demonstrate ability to observe temperature gauge frequently when pulling heavy loads up long grades.
11.21 Describe the effect of vehicle weight & speed upon braking & shifting ability on long downgrades.
11.22 Identify the meaning & use of percent of grade signs.
11.23 Demonstrate bringing the truck to a stop in the shortest possible distance while maintaining directional control on a dry surface.
11.24 Demonstrate a quick evasive turn on a dry surface.
11.25 Describe procedures to make an evasive turn off the roadway & return to the roadway while maintaining directional control.
11.26 Describe procedure to bring the vehicle to a stop in the event of a brake failure.
11.27 Describe procedure to maintain control of the vehicle in the event of a blowout.
11.28 Demonstrate ability to turn the steering wheel 180(o) in either direction quickly while maintaining a grip on the steering wheel.
11.29 Describe procedures to bring tractor trailer to a stop in the shortest possible distance while maintaining directional control when operating on a slippery surface.
11.30 Describe procedures to recover from tractor or trailer skids induced by snow, ice, water, oil, sand, wet leaves or other slippery surfaces.
11.31 Describe procedures to countersteer out of a skid in a way that will regain directional control & not produce another skid.
11.32 Demonstrate ability to operate brakes properly to provide maximum breaking without loss of control.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other employees.
12.07 Identify and adopt acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.

3.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK **PROGRAM AREA:** Industrial

FLORIDA DEPARTMENT OF EDUCATION **EFFECTIVE DATE:** July, 1987

PROGRAM TITLE: Communication Electronics

CODE NUMBER: Secondary ______ Postsecondary EET0300

Florida CIP IN47.010300

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational __x__ Other 13-17

CERTIFICATION COVERAGE: TEC ELEC @ 7 ELECTRONIC 7 RADIO COMM @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as radio mechanics (823.261-018), marine radio installers/repairers (823.281-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the assembly, installation, operation, maintenance and repair of one- and two-way communications equipment and systems.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in using actual equipment or educational trainers in various types of equipment, motors, mechanical devices, power suppliers, amplifiers, digital circuitry and the use of testing equipment and Federal Communications Commission licensing requirements.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in DC electronics.
02. Demonstrate proficiency in AC electronics.
03. Demonstrate proficiency in semiconductor devices and circuits.
04. Demonstrate proficiency in electronic circuits.
05. Demonstrate proficiency in digital circuits and devices.
06. Demonstrate proficiency in microprocessors.
07. Demonstrate proficiency in soldering chassis assembly techniques.
08. Demonstrate appropriate lab/shop skills.

Communication Electronics - Continued

09. Read, interpret and write technical reports.
10. Troubleshoot and repair signal generating and processing systems.
11. Troubleshoot and repair demodulation/modulation systems.
12. Troubleshoot and repair carrier signal generation and processing systems and circuits.
13. Troubleshoot and repair electromagnetic radiation systems.
14. Set up and operate test equipment.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education
SECONDARY NUMBER: ________
PROGRAM TITLE: Communication Electronics
POSTSECONDARY NUMBER: EET0300

01.0 DEMONSTRATE PROFICIENCY IN DC ELECTRONICS THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF TOOLS AND TEST EQUIPMENT, AND TROUBLESHOOTING PROCEDURES--The student will be able to:

01.01 Solve electronic math problems related to DC circuits including series, parallel, and series-parallel circuits.
01.02 Identify and define electron theory and sources of electrical energy.
01.03 Define the relationship between current, voltage, resistance and power.
01.04 Solve basic electronic problems involving current, voltage, resistance and power.
01.05 Identify and measure resistors.
01.06 Use an analog and digital multimeter to measure current, voltage, resistance, and continuity of passive components.
01.07 Draw, analyze, construct and troubleshoot series circuits.
01.08 Draw, analyze, construct and troubleshoot parallel circuits.
01.09 Draw, analyze, construct and troubleshoot series-parallel circuits.
01.10 Draw, analyze, construct and troubleshoot voltage divider circuits.
01.11 Demonstrate a knowledge of magnetism and electromagnetism.
01.12 Analyze and calculate RL and RC time constants.
01.13 Set up and operate power supplies for DC circuits.
01.14 Set up and operate oscilloscopes for DC circuits.
01.15 Troubleshoot and locate defective components in a functional DC circuit consisting of resistors, relays, lamps, switches, fuses, inductors, rheostats, potentiometers, capacitors, conductors, and power supplies.

02.0 DEMONSTRATE PROFICIENCY IN AC ELECTRONICS THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF APPROPRIATE TOOLS AND TEST EQUIPMENT, AND TROUBLESHOOTING PROCEDURES--The student will be able to:

02.01 Solve electronics math problems related to AC circuits including: RC, RL, RLC, LC, and Z for series, parallel and series-parallel circuits.
02.02 Identify properties of an AC sineusoidol waveform.
02.03 Use an analog and digital multimeter to measure current, voltage, resistance, and continuity of passive components.
02.04 Draw, analyze, construct, and troubleshoot AC resistive circuits.
02.05 Draw, analyze, construct, and troubleshoot series, parallel, and series-parallel capacitive and resistive-capacitive circuits.
02.06 Draw, analyze, construct, and troubleshoot series, parallel, and series-parallel inductive and resistive-inductive circuits.
02.07 Draw, analyze, construct, and troubleshoot series, parallel, and capacitive-inductive circuits.
02.08 Draw, analyze, construct, and troubleshoot transformer circuits.
02.09 Draw, analyze, construct, and troubleshoot series, parallel, and series-parallel resistive-capacitive-inductive circuits.
02.10 Draw, analyze, construct, and troubleshoot series and parallel resonant circuits.
02.11 Draw, analyze, construct, and troubleshoot low-pass, high-pass, bandpass, and reject active filters.
02.12 Analyze basic motor and generator theory and operation.
02.13 Set up and operate power supplies for AC circuits.
02.14 Set up and operate oscilloscopes for AC circuits.
02.15 Set up and operate frequency counters for AC circuits.
02.16 Set up and operate signal generators for AC circuits.
02.17 Troubleshoot and locate defective components in a functional AC circuit consisting of resistors, capacitors, inductors, and transformers.

03.0 DEMONSTRATE PROFICIENCY IN SEMICONDUCTOR DEVICES THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF TOOLS AND TEST EQUIPMENT--The student will be able to:

03.01 Identify properties of semiconductor material.
03.02 Analyze and measure characteristics of P-N diodes.

03.03 Analyze and measure characteristics of special diodes, including: tunnel rectifier, zener, varactor.
03.04 Analyze and measure characteristics of Bipolar Junction Transistors (BJT).
03.05 Analyze and measure characteristics of Field Effect Transistor (FET).
03.06 Analyze and measure characteristics of Metal Oxide Semiconductor Field Effect Transistor (MOSFET).
03.07 Analyze and measure characteristics of Thyristors.
03.08 Analyze and measure characteristics of Optoelectronic devices.
03.09 Analyze and measure characteristics of Operational Amplifiers (OpAmp).
03.10 Describe Integrated Circuits: importance, construction, and application in digital and linear circuits.
03.11 Set up and operate multimeters for solid state devices.
03.12 Set up and operate oscilloscopes for solid state devices.
03.13 Set up and operate curve tracers for solid state devices.
03.14 Set up and operate transistor testers for solid state devices.

04.0 DEMONSTRATE PROFICIENCY IN ELECTRONIC CIRCUITS THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF TOOLS AND TEST EQUIPMENT, AND TROUBLESHOOTING PROCEDURES--The student will be able to:

04.01 Draw, analyze, construct, and troubleshoot diode circuits.
04.02 Draw, analyze, construct, and troubleshoot power supply, regulator, and filter circuits.
04.03 Draw, analyze, construct, and troubleshoot single-stage amplifier circuits.
04.04 Draw, analyze, construct, and troubleshoot multi-stage amplifier circuits.
04.05 Draw, analyze, construct, and troubleshoot oscillator circuits.
04.06 Draw, analyze, construct, and troubleshoot wave-shaping circuits.
04.07 Draw, analyze, construct, and troubleshoot operational amplifier circuits.
04.08 Draw, analyze, construct, and troubleshoot active filter circuits.
04.09 Set up and operate multimeters for analog circuits.
04.10 Set up and operate oscilloscopes for analog circuits.
04.11 Set up and operate frequency counters for analog circuits.
04.12 Set up and operate signal generators for analog circuits.
04.13 Set up and operate transistor testors for analog circuits.

05.0 DEMONSTRATE PROFICIENCY IN DIGITAL CIRCUITS AND DEVICES THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF TOOLS AND TEST EQUIPMENT AND TROUBLESHOOTING PROCEDURES--The student will be able to:

05.01 Identify number systems and solve digital math problems using: binary, octal, and hexadecimal radix; and solve boolean algebra problems.
05.02 Identify characteristics of Integrated Circuits (IC) logic families using: Resistor-Transistor Logic (RTL), Diode-Transistor Logic (DTL), Transistor-Transistor Logic (TTL), Emitter-Coupled Logic (ECL), MOS, and Complementary-MOS.
05.03 Draw, analyze, construct and troubleshoot OR/NOR, AND/NAND, XOR gates.
05.04 Analyze and minimize logic circuits using: Boolean Algebra and Karnaugh Maps.
05.05 Draw, analyze, construct and troubleshoot Flip-Flops and Latches circuits using: "R-S", "D", "T", and "J-K devices.
05.06 Draw, analyze, construct and troubleshoot clock and timing circuits.
05.07 Draw, analyze, construct and troubleshoot registers and counters.
05.08 Draw, analyze, construct and troubleshoot arithmetic circuits.
05.09 Draw, analyze, construct and troubleshoot combinational logic circuits.
05.10 Draw, analyze, construct and troubleshoot encoders and decoders.
05.11 Draw, analyze, construct and troubleshoot multiplexers and demultiplexers.
05.12 Draw, analyze, construct and troubleshoot memory circuits.
05.13 Draw, analyze, construct and troubleshoot analog-to-digital and digital-to-analog circuits.
05.14 Draw, analyze, construct and troubleshoot display circuits.
05.15 Set up and operate multimeters for digital circuits.
05.16 Set up and operate logic probes and pulsers for digital circuits.
05.17 Set up and operate oscilloscopes for digital circuits.

05.18 Set up and operate logic/data analyzers for digital circuits.

06.0 DEMONSTRATE PROFICIENCY IN MICROPROCESSORS THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF TOOLS AND TEST EQUIPMENT, AND TROUBLE-SHOOTING PROCEDURES--The student will be able to:

06.01 Analyze architecture of a Microprocessor Unit (MPU).
06.02 Analyze functions of a MPU.
06.03 Analyze theory and operation of a MPU.
06.04 Analyze instruction set of a MPU.
06.05 Operate MPU system.
06.06 Write, debug, and execute programs using MPU instruction set.
06.07 Apply input/output (I/O) techniques.
06.08 Analyze MPU system hardware.
06.09 Troubleshoot MPU system hardware.
06.10 Draw and analyze MPU system interface circuits.
06.11 Construct and troubleshoot MPU system interface circuits.
06.12 Set up and operate DVM for MPU system measurements.
06.13 Set up and operate logic probes for MPU system measurements (TTL-CMOS compatible; memory; 10MHZ.)
06.14 Set up and operate pulser probes for MPU system measurements.
06.15 Set up and operate oscilloscopes for MPU system measurements (Minimum 60MHZ).
06.16 Set up and operate logic/data analyzers for MPU system measurements (Minimum 16 channels).
06.17 Set up and operate pulse generators for MPU system measurements.
06.18 Set up and operate frequency counters for MPU system measurements (0-200MHZ).

07.0 DEMONSTRATE PROFICIENT SOLDERING AND CHASSIS ASSEMBLY TECHNIQUES--The student will be able to:

07.01 Select, maintain, and use soldering and desoldering tools.
07.02 Use solders with different tin/lead percentages.
07.03 Solder conductors and components to: turret, cup, bifurcated, hooked, pierced terminals and connectors.
07.04 Solder axial lead components to Printed Circuit (PC) boards.
07.05 Remove components and conductors from terminals without damage, including: IC's, TO-5, transistors, diodes, transformers and controls.
07.06 Repair damaged PC board circuitry.

08.0 DEMONSTRATE APPROPRIATE LAB/SHOP SKILLS--The student will be able to:

08.01 Apply proper safety standards.
08.02 Make electrical connections.
08.03 Identify and use hand tools properly.
08.04 Identify and use power tools properly.
08.05 Handle static sensitive devices.
08.06 Read and interpret circuit schematic and block diagrams and technical specifications.

09.0 READ, INTERPRET, AND WRITE TECHNICAL REPORTS--The student will be able to:

09.01 Draw and interpret electronic schematics.
09.02 Record data and design curves and graphs.
09.03 Write reports.
09.04 Maintain test logs.
09.05 Make equipment failure reports.
09.06 Specify and requisition simple electronic components.
09.07 Compose technical letters.
09.08 Write formal reports of laboratory experiences.

10.0 TROUBLESHOOT AND REPAIR SIGNAL GENERATING AND PROCESSING SYSTEMS--The student will be able to:

10.01 Trace history and development of communications electronics.
10.02 Define terminology used in communications electronics.
10.03 Apply FCC rules and regulations to communications situations.
10.04 Determine operational status of audio systems.
10.05 Troubleshoot audio systems.
10.06 Remove and replace audio systems components.
10.07 Conduct operating systems check of audio systems and make minor adjustments.

10.08 Determine operational status of video systems.
10.09 Troubleshoot video systems.
10.10 Remove and replace video systems components.
10.11 Conduct operating systems check of video systems and make minor adjustments.
10.12 Determine operational status of receiving systems.
10.13 Troubleshoot receiving systems.
10.14 Remove and replace receiving systems components.
10.15 Conduct operating systems check of receiving systems and make minor adjustments.
10.16 Determine operational status of transmitting systems.
10.17 Troubleshoot transmitting systems.
10.18 Remove and replace transmitting systems components.
10.19 Conduct operating systems check of transmitting systems and make minor adjustments.
10.20 Determine operational status of remote control systems.
10.21 Troubleshoot remote control systems.
10.22 Remove and replace remote control systems components.
10.23 Conduct operating systems check of remote control systems and make minor adjustments.
10.24 Determine operational status of optical device electronic systems.
10.25 Troubleshoot optical device electronic systems.
10.26 Remove and replace optical device electronic systems components.
10.27 Conduct operating systems check of optical device electronic systems and make minor adjustments.

11.0 TROUBLESHOOT AND REPAIR DEMODULATION/MODULCATION SYSTEMS--The student will be able to:

11.01 Determine operational status of AM circuits.
11.02 Troubleshoot AM circuits.
11.03 Remove and replace AM circuit components.
11.04 Conduct operating systems check of AM circuits and make minor adjustments.
11.05 Determine operational status of SSB circuits.
11.06 Troubleshoot SSB circuits.
11.07 Remove and replace SSB circuit components.
11.08 Conduct operating systems check of SSB circuits and make minor adjustments.
11.09 Determine operational status of DSSC circuits.
11.10 Troubleshoot DSSC circuits.
11.11 Remove and replace DSSC circuit components.
11.12 Conduct operating systems check of DSSC circuits and make minor adjustments.
11.13 Determine operational status of FM circuits.
11.14 Troubleshoot FM circuits.
11.15 Remove and replace FM circuit components.
11.16 Conduct operating systems check of FM circuits and make minor adjustments.
11.17 Determine operational status of phase modulation circuits.
11.18 Troubleshoot phase modulation circuits.
11.19 Remove and replace phase modulation circuit components.
11.20 Conduct operating systems check of phase modulation circuits and make minor adjustments.
11.21 Determine operational status of pulse modulation circuits.
11.22 Troubleshoot pulse modulation circuits.
11.23 Remove and replace pulse modulation circuit components.
11.24 Conduct operating systems check of pulse modulation circuits and make minor adjustments.
11.25 Determine operational status of multiplex circuits.
11.26 Troubleshoot multiplex circuits.
11.27 Remove and replace multiplex circuit components.
11.28 Conduct operating systems check of multiplex circuits and make minor adjustments.

12.0 TROUBLESHOOT AND REPAIR CARRIER SIGNAL GENERATION AND PROCESSING SYSTEMS AND CIRCUITS--The student will be able to:

12.01 Determine operational status of multiplier circuits.
12.02 Troubleshoot multiplier circuits.
12.03 Remove and replace multiplier circuit components.
12.04 Conduct operating systems check of multiplier circuits and make minor adjustments.
12.05 Determine operational status of heterodyning circuits.
12.06 Troubleshoot heterodyning circuits.

12.07 Remove and replace heterodyning circuit components.
12.08 Conduct operating systems check of heterodyning circuits and make minor adjustments.
12.09 Determine operational status of frequency synthesis circuits.
12.10 Troubleshoot frequency synthesis circuits.
12.11 Remove and replace frequency synthesis circuit components.
12.12 Conduct operating systems check of frequency synthesis circuits and make minor adjustments.
12.13 Determine operational status of phased locked loop circuits.
12.14 Troubleshoot phased locked loop circuits.
12.15 Remove and replace phased locked loop circuit components.
12.16 Conduct operating systems check of phased locked loop circuits and make minor adjustments.
12.17 Determine operational status of signal filtering circuits.
12.18 Troubleshoot signal filtering circuits.
12.19 Remove and replace signal filtering circuit components.
12.20 Conduct operating systems check of signal filtering circuits and make minor adjustments.
12.21 Determine operational status of RF power amplifier circuits.
12.22 Troubleshoot RF power amplifier circuits.
12.23 Remove and replace RF power amplifier circuit components.
12.24 Conduct operating systems check of RF power amplifier circuits and make minor adjustments.
12.25 Determine operational status of automatic control circuits.
12.26 Troubleshoot automatic control circuits.
12.27 Remove and replace automatic control circuit components.
12.28 Conduct operating systems check of automatic control circuits and make minor adjustments.
12.29 Determine operational status of microwave devices and circuits.
12.30 Troubleshoot microwave devices and circuits.
12.31 Remove and replace microwave devices and circuit components.
12.32 Conduct operating systems check of microwave devices and circuits and make minor adjustments.

13.0 TROUBLESHOOT AND REPAIR ELECTROMAGNETIC RADIATION SYSTEMS--The student will be able to:

13.01 Analyze electromagnetic propagations.
13.02 Determine operational status of transmission lines.
13.03 Troubleshoot transmission lines.
13.04 Remove and replace transmission lines.
13.05 Conduct operating systems check of transmission lines and make minor adjustments.
13.06 Determine operational status of antenna systems.
13.07 Troubleshoot antenna systems.
13.08 Remove and replace antenna system components.
13.09 Conduct operating systems check of antenna systems and make minor adjustments.
13.10 Determine operational status of microwave systems.
13.11 Troubleshoot microwave systems.
13.12 Remove and replace microwave system components.
13.13 Conduct operating systems check of microwave systems and make minor adjustments.
13.14 Determine operational status of satellite systems.
13.15 Troubleshoot satellite systems
13.16 Remove and replace satellite system components.
13.17 Conduct operating systems check of satellite systems and make minor adjustments.

14.0 SET UP AND OPERATE TEST EQUIPMENT--The student will be able to:

14.01 Set up and operate spectrum analyzers.
14.02 Set up and operate sweep generators.
14.03 Set up and operate power meters.
14.04 Set up and operate field strength meters.
14.05 Set up and operate power reflection meters.
14.06 Set up and operate TD reflectometers.
14.07 Set up and operate impedance bridges.
14.08 Set up and operate dummy loads.
14.09 Set up and operate phase meters.
14.10 Set up and operate distortion meters.
14.11 Set up and operate noise analyzers.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job interview.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Computer Electronics

CODE NUMBER: Secondary ___________ Postsecondary CTK0995

Florida CIP IN IN47.010400

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ________

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 13-17

CERTIFICATION COVERAGE: COMP SVC 7 ELECTRONIC 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as computer electronics technicians (003.161-014), computer service technicians (003.161-014), or electronics technicians (003.161-014).

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the installation, programming, operation, maintenance, servicing, diagnosis, and correction of operational problems in computer systems arising from mechanical, electrical or electronics malfunctions. This program includes most of the competencies applicable to the common core of electronics program; these are identified by the designation (CE).

II. LABORATORY ACTIVITIES: Shop or activities are an integral part of this program and provide instruction in the use of tools, test equipment, materials and processes found in industry. Students use various types of precision test equipment for analyzing, troubleshooting and repairing computer circuitry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communications, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher, and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The common core of electronics competencies are identified with the designation (CE).

In accordance with Section 233.0395 F.S., the minimum basic skills grade level required for this post secondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 contact hours (2160 clock hours).

IV. INTENDED OUTCOMES: After successfuly completing this program the student will be able to:

01. Demonstrate proficiency in laboratory practices.
02. Demonstrate proficiency in DC circuits.
03. Demonstrate proficiency in AC circuits.
04. Demonstrate proficiency in solid-state devices.
05. Demonstrate proficiency in analog circuits.
06. Demonstrate proficiency in digital devices.
07. Demonstrate proficiency in microprocessing.
08. Demonstrate proficiency in computer systems architecture.
09. Demonstrate proficiency in software fundamentals.
10. Demonstrate an understanding of communication interfacing.
11. Demonstrate an understanding of peripheral equipment.
12. Demonstrate an understanding of customer site requirements/considerations.
13. Demonstrate an ability to perform technical recording and reporting.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ____________

PROGRAM TITLE: Computer Electronics POSTSECONDARY NUMBER: CTK0995

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES (Note: Competencies 01.01 thru 01.07 apply to all subsequent categories and competency statements.)--The student will be able to:

01.01 Apply proper OSHA safety standards (CE).
01.02 Make electrical connections (CE).
01.03 Identify and use hand tools properly (CE).
01.04 Identify and use power tools properly (CE).
01.05 Demonstrate acceptable soldering and desoldering techniques (CE).
01.06 Apply basic keyboard skills.
01.07 Identify, write, and describe the purpose of technical reports.

02.0 DEMONSTRATE PROFICIENCY IN DC CIRCUITS--The student will be able to:

02.01 Solve algebraic problems to include exponentials (prerequisite to DC) (CE).
02.02 Relate electricity to the nature of matter (CE).
02.03 Identify sources of electricity (CE).
02.04 Define voltage, current, resistance, power, and energy (CE).
02.05 Apply and relate Ohm's law (CE).
02.06 Read and interpret color codes and symbols to identify electrical components and values (CE).
02.07 Measure properties of a circuit using VOM and DVM meters (CE).
02.08 Compute and measure conductance and resistance of conductors and insulators (CE).
02.09 Apply Ohm's law to series circuits (CE).
02.10 Construct and verify operation of series circuits (CE).
02.11 Troubleshoot series circuits (CE).
02.12 Apply Ohm's law to parallel circuits (CE).
02.13 Construct and verify the operation of parallel circuits (CE).
02.14 Troubleshoot parallel circuits (CE).
02.15 Apply Ohm's law to series-parallel circuits (CE).
02.16 Construct and verify the operation of series-parallel circuits (CE).
02.17 Troubleshoot series-parallel circuits (CE).
02.18 Identify and define voltage divider circuits (loaded and unloaded) (CE).
02.19 Construct and verify the operation of voltage divider circuits (loaded and unloaded) (CE).
02.20 Troubleshoot voltage divider circuits (loaded and unloaded) (CE).
02.21 Apply maximum power theory (CE).
02.22 Construct and verify the operation of DC circuits that demonstrate the maximum power transfer theory (CE).
02.23 Define magnetic properties of circuits and devices (CE).
02.24 Determine the physical and electrical characteristics of capacitors and inductors (CE).
02.25 Define RC and RL time constants and classify the output of differentiators and integrators (CE).
02.26 Construct and verify the operation of differentiators and integrators to determine RC and RL time constants (CE).
02.27 Troubleshoot differentiator and integrator circuits (CE).
02.28 Set up and operate a VOM for DC circuits (CE).
02.29 Set up and operate a DVM for DC circuits (CE).
02.30 Set up and operate power supplies for DC circuits (CE).
02.21 Set up and operate oscilloscopes for DC circuits (CE).

03.0 DEMONSTRATE PROFICIENCY IN AC CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electronics (prerequisite to AC) (CE).
03.02 Identify properties of an AC signal (CE).
03.03 Identify AC sources (CE).
03.04 Analyze and measure AC signals using oscilloscope, frequency meter, and generator (CE).

03.05 Define the characteristics of AC capacitive circuits (CE).
03.06 Construct and verify the operation of AC capacitive circuits (CE).
03.07 Troubleshoot AC capacitive circuits (CE).
03.08 Define the characteristics of AC inductive circuits (CE).
03.09 Construct and verify the operation of AC inductive circuits (CE).
03.10 Troubleshoot AC inductive circuits (CE).
03.11 Define and apply the principles of transformers to AC circuits (CE).
03.12 Construct and verify the operation of AC circuits utilizing transformers (CE).
03.13 Troubleshoot AC circuits utilizing transformers (CE).
03.14 Define the characteristics of RLC circuits (series, parallel, and complex) (CE).
03.15 Construct and verify the operation of RLC circuits (series, parallel, and complex) (CE).
03.16 Define the characteristics of series and parallel resonant circuits (CE).
03.17 Construct and verify the operation of series and parallel resonant circuits (CE).
03.18 Define the characteristics of filter circuits (CE).
03.19 Construct and verify the operation of filter circuits (CE).
03.20 Troubleshoot filter circuits (CE).
03.21 Define the characteristics of polyphase circuits (CE).
03.22 Define basic motor theory and operation (CE).
03.23 Define basic generator theory and operation (CE).
03.24 Set up and operate a VOM for AC circuits (CE).
03.25 Set up and operate a DVM for AC circuits (CE).
03.26 Set up and operate power supplies for AC circuits (CE).
03.27 Set up and operate oscilloscopes for AC circuits (CE).
03.28 Set up and operate frequency counters for AC circuits (CE).
03.29 Set up and operate signal generators for AC circuits (CE).
03.30 Set up and operate capacitor/inductor analyzers for AC circuits (CE).
03.31 Set up and operate impedance bridges for AC circuits (CE).

04.0 DEMONSTRATE PROFICIENCY IN SOLID-STATE DEVICES--The student will be able to:

04.01 Identify properties of semiconductor materials (CE).
04.02 Identify and define operating characteristics and applications of pn junction diodes (CE).
04.03 Identify and define operating characteristics and applications of special diodes (CE).
04.04 Analyze diode circuits (CE).
04.05 Construct diode circuits (CE).
04.06 Troubleshoot diode circuits (CE).
04.07 Identify and define operating characteristics and applications of bipolar transistors (CE).
04.08 Identify and define operating characteristics and applications of field effect transistors (FET's) (CE).
04.09 Identify and define operating characteristics and applications of thyristors (CE).
04.10 Identify and define operating characteristics and applications of integrated circuits (CE).
04.11 Set up and operate a VOM for solid-state devices (CE).
04.12 Set up and operate a DVM for solid-state devices (CE).
04.13 Set up and operate power supplies for solid-state devices (CE).
04.14 Set up and operate oscilloscopes for solid-state devices (CE).
04.15 Set up and operate frequency counters for solid-state devices (CE).
04.16 Set up and operate signal generators for solid-state devices (CE).
04.17 Set up and operate capacitor/inductor analyzers for solid-state devices (CE).
04.18 Set up and operate impedance bridges for solid-state devices (CE).
04.19 Set up and operate curve tracers (CE).
04.20 Set up and operate transistor testers (CE).

05.0 DEMONSTRATE PROFICIENCY IN ANALOG CIRCUITS--The student will be able to:

05.01 Identify and define operating characteristics and applications of single-stage amplifiers (CE).

05.02 Construct single-stage amplifiers (CE).
05.03 Troubleshoot single-stage amplifiers (CE).
05.04 Identify and define operational characteristics and applications of multistage amplifiers (CE).
05.05 Construct multistage amplifiers (CE).
05.06 Troubleshoot multistage amplifiers (CE).
05.07 Identify and define operating characteristics and applications of basic power supplies and filters (CE).
05.08 Construct basic power supplies and filters (CE).
05.09 Troubleshoot basic power supplies and filters (CE).
05.10 Identify and define operating characteristics and applications of differential and operational amplifiers (CE).
05.11 Construct differential and operational amplifiers (CE).
05.12 Troubleshoot differential and operational amplifiers (CE).
05.13 Identify and define operating characteristics and applications of power supply regulators (CE).
05.14 Construct power supply regulators (CE).
05.15 Troubleshoot power supply regulators (CE).
05.16 Identify and define operating characteristics and applications of active filters (CE).
05.17 Construct active filters (CE).
05.18 Troubleshoot active filters (CE).
05.19 Identify and define operating characteristics and applications of sinusoidal and non-sinusoidal oscillators (CE).
05.20 Construct oscillators (Optional in high school and vocational programs) (CE).
05.21 Troubleshoot oscillators (CE).
05.22 Identify and define operating characteristics and applications of motor phase-control circuits (single-phase and multiphase) (CE).
05.23 Identify and define operating characteristics and applications of cathode ray tubes (CRT's) as used in video terminals (CE).
05.24 Identify and define operating characteristics and applications of optical devices (CE).
05.25 Set up and operate a VOM for analog circuits (CE).
05.26 Set up and operate a DVM for analog circuits (CE).
05.27 Set up and operate power supplies for analog circuits (CE).
05.28 Set up and operate oscilloscopes for analog circuits (CE).
05.29 Set up and operate frequency counters for analog circuits (CE).
05.30 Set up and operate signal generators for analog circuits (CE).
05.31 Set up and operate impedance bridges for analog circuits (CE).

06.0 DEMONSTRATE PROFICIENCY IN DIGITAL DEVICES--The student will be able to:

06.01 Define and apply numbering systems (hex., bin., and oct.)to codes and arithmetic (CE).
06.02 Analyze/minimize logic circuits using Boolean operations (CE).
06.03 Set up and operate a VOM for digital devices (CE).
06.04 Set up and operate DVM for digital devices (CE).
06.05 Set up and operate logic probes for digital devices (CE).
06.06 Set up and operate power supplies for digital devices and solve power distribution and noise problems (CE).
06.07 Set up and operate pulsers for digital devices (CE).
06.08 Set up and operate oscilloscopes for digital devices (CE).
06.09 Set up and operate logic analyzers for digital devices (CE).
06.10 Set up and operate pulse generators for digital devices (CE).
06.11 Set up and operate counters for digital devices (CE).
06.12 Identify types of logic gates and their truth tables (CE).
06.13 Construct logic gates using discrete components (CE).
06.14 Troubleshoot logic gates (CE).
06.15 Identify and define types of flip-flops and their truth and excitation tables (CE).
06.16 Construct flip-flops using discrete components (CE).
06.17 Troubleshoot flip-flops (CE).
06.18 Identify, define, and measure characteristics of integrated-circuit (IC) logic families and electro-static sensitive devices(CE).
06.19 Identify types of registers and counters (CE).
06.20 Construct registers and counters using flip-flops (CE).
06.21 Troubleshoot registers and counters (CE).
06.22 Identify and define clock and timing circuits (CE).
06.23 Construct clock and timing circuits (CE).

06.24 Troubleshoot clock and timing circuits (CE).
06.25 Identify and relate types of logic circuits (CE).
06.26 Construct logic-arithmetic circuits (CE).
06.27 Troubleshoot logic-arithmetic circuits (CE).
06.28 Identify types of encoding and decoding devices (CE).
06.29 Construct encoders and decoders (CE).
06.30 Troubleshoot encoders and decoders (CE).
06.31 Identify multiplexer and demultiplexer circuits (CE).
06.32 Construct multiplexer and demultiplexer circuits (CE).
06.33 Troubleshoot multiplexer and demultiplexer circuits (CE).
06.34 Identify types of memory circuits (static, dynamic, volatile, nonvolatile, and programmable devices, etc.) (CE).
06.35 Use memory devices in circuits (CE).
06.36 Troubleshoot memory-device circuits (CE).
06.37 Relate the uses of digital-to-analog and analog-to-digital conversions (CE).
06.38 Construct digital-to-analog and analog-to-digital circuits (CE).
06.39 Troubleshoot digital-to-analog and analog-to-digital circuits (CE).
06.40 Identify types of displays (LED, LCD, etc.) (CE).
06.41 Construct display circuits (CE).
06.42 Troubleshoot display circuits (CE).
06.43 Analyze representative digital systems (Student Project).
06.44 Design, construct, and troubleshoot representative digital systems (Student Project).
06.45 Demonstrate applications of representative digital systems (Student Project).

07.0 DEMONSTRATE PROFICIENCY IN MICROPROCESSING--The student will be able to:

07.01 Identify CPU (Architecture) building blocks and their uses.
07.02 Analyze BUS concepts (CE).
07.03 Analyze various memory schemes (CE).
07.04 Set up and operate a VOM for microprocessing analysis (CE).
07.05 Set and operate a DVM for microprocessing analysis (CE).
07.06 Set up and operate power supplies for microprocessor use (CE).
07.07 Set up and operate oscilloscopes for microprocessors (CE).
07.08 Set up and operate logic/data analyzers for microprocessor de-bug (CE).
07.09 Identify types of input and output devices and peripherals (PIA's, UART's, etc.) (CE).
07.10 Interface input and output ports (RS-232, RS-422, etc.) (CE).
07.11 Troubleshoot input and output ports (CE).
07.12 Execute computer instruction sets (CE).
07.13 Design and lay out a unique microprocessing system (Student Project).
07.14 Construct a unique microprocessing application system (Student Project).
07.15 Troubleshoot and demonstrate proficiency in a unique application in microprocessor systems (Student Project).
07.16 Construct and troubleshoot a single-chip microprocessor system.
07.17 Construct and troubleshoot an advanced microcomputer system.

08.0 DEMONSTRATE PROFICIENCY IN COMPUTER SYSTEMS ARCHITECTURE--The student will be able to:

08.01 Draw and explain systems configurations in block detail.
08.02 Interpret computer acronyms.
08.03 Identify and define priorities/interrupts at system level.
08.04 Define and list D.M.A. data handling systems (direct memory access).
08.05 Define functions of advanced memory techniques (virtual, pipeline, cache).
08.06 Troubleshoot a microcomputer system.

09.0 DEMONSTRATE PROFICIENCY IN SOFTWARE FUNDAMENTALS--The student will be able to:

09.01 Load and run operating system software.
09.02 Load and run diagnostic software.
09.03 Construct flow charts.

09.04 Analyze flow charts.
09.05 Identify and define computer languages and their uses.
09.06 Write a simple computer program in BASIC.
09.07 Write a computer program in assembly language.
09.08 Write a computer program in machine language.
09.09 Analyze firmware concepts

10.0 DEMONSTRATE AN UNDERSTANDING OF COMMUNICATION INTERFACING--The student will be able to:

10.01 Identify and define EIA, IEEE, and CCITT standards.
10.02 Identify, define and analyze sync devices.
10.03 Identify, define and analyze async devices.
10.04 Identify and define networking levels or layers.
10.05 Identify and define protocols.
10.06 Identify and define packet switching.
10.07 Identify and define multi-user systems.

11.0 DEMONSTRATE AN UNDERSTANDING OF PERIPHERAL EQUIPMENT--The student will be able to:

11.01 List types of card and papertape equipment and interface controllers.
11.02 Analyze and troubleshoot display terminals and interface controllers.
11.03 Analyze and troubleshoot printers and interface controllers.
11.04 Align printers and interface controllers.
11.05 Describe the operation of typical magnetic tape equipment and interface controllers.
11.06 Analyze disk equipment and interface controllers.
11.07 Troubleshoot and repair disk equipment and interface controllers.
11.08 Align disk equipment and interface controllers.
11.09 Define environmental requirements for peripherals/media.

12.0 DEMONSTRATE AN UNDERSTANDING OF CUSTOMER SITE REQUIREMENTS/CONSIDERATIONS --The student will be able to:

12.01 Apply effective relations.
12.02 Follow installation procedures.
12.03 Calculate/determine power requirements.
12.04 Calculate/determine environmental requirements.
12.05 List and perform PM techniques and requirements.

13.0 DEMONSTRATE AN ABILITY TO PERFORM TECHNICAL RECORDING AND REPORTING--The student will be able to:

13.01 Draw and interpret electronic schematics (CE).
13.02 Record data and design curves and graphs (CE).
13.03 Write reports and make oral presentations (CE).
13.04 Maintain test logs (CE).
13.05 Make equipment failure reports (CE).
13.06 Specify and requisition simple electronic components (CE).
13.07 Compose technical letters and memoranda (CE).
13.08 Write formal reports of laboratory experiences (CE).

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents that may be required when applying for a job.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.
14.10 Write a resume.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.

15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Computer Servicing Technology

CODE NUMBER: Secondary ________ Postsecondary CTK0990

Florida CIP IN IN15.040200

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

___ Postsecondary Vocational X Other 13-15

CERTIFICATION COVERAGE: COMP SVC 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as computer electronics technicians (003.161-014), computer service technicians (003.161-014), or electronics technicians (003.161-014).

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the installation, programming, operation, maintenance, servicing, diagnosis, and correction of operational problems in computer systems arising from mechanical, electrical or electronics malfunctions. This program includes most of the competencies applicable to the common core of electronics program; these are identified by the designation (CE).

II. LABORATORY ACTIVITIES: Shop or activities are an integral part of this program and provide instruction in the use of tools, test equipment, materials and processes found in industry. Students use various types of precision test equipment for analyzing, troubleshooting and repairing computer circuitry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communications, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher, and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The common core of electronics competencies are identified with the designation (CE).

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this post secondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 contact hours (2160 clock hours).

IV. INTENDED OUTCOMES: After successfuly completing this program the student will be able to:

01. Demonstrate proficiency in laboratory practices.
02. Demonstrate proficiency in DC circuits.
03. Demonstrate proficiency in AC circuits.
04. Demonstrate proficiency in solid-state devices.
05. Demonstrate proficiency in analog circuits.
06. Demonstrate proficiency in digital devices.
07. Demonstrate proficiency in microprocessing.
08. Demonstrate proficiency in computer systems architecture.
09. Demonstrate proficiency in software fundamentals.
10. Demonstrate an understanding of communication interfacing.
11. Demonstrate an understanding of peripheral equipment.
12. Demonstrate an understanding of customer site requirements/considerations.
13. Demonstrate an ability to perform technical recording and reporting.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ____________

PROGRAM TITLE: Computer Servicing Technology POSTSECONDARY NUMBER: CTK0990

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES (Note: Competencies 01.01 thru 01.07 apply to all subsequent categories and competency statements.)--The student will be able to:

01.01 Apply proper OSHA safety standards (CE).
01.02 Make electrical connections (CE).
01.03 Identify and use hand tools properly (CE).
01.04 Identify and use power tools properly (CE).
01.05 Demonstrate acceptable soldering and desoldering techniques (CE).
01.06 Apply basic keyboard skills.
01.07 Identify, write, and describe the purpose of technical reports.

02.0 DEMONSTRATE PROFICIENCY IN DC CIRCUITS--The student will be able to:

02.01 Solve algebraic problems to include exponentials (prerequisite to DC) (CE).
02.02 Relate electricity to the nature of matter (CE).
02.03 Identify sources of electricity (CE).
02.04 Define voltage, current, resistance, power, and energy (CE).
02.05 Apply and relate Ohm's law (CE).
02.06 Read and interpret color codes and symbols to identify electrical components and values (CE).
02.07 Measure properties of a circuit using VOM and DVM meters (CE).
02.08 Compute and measure conductance and resistance of conductors and insulators (CE).
02.09 Apply Ohm's law to series circuits (CE).
02.10 Construct and verify operation of series circuits (CE).
02.11 Troubleshoot series circuits (CE).
02.12 Apply Ohm's law to parallel circuits (CE).
02.13 Construct and verify the operation of parallel circuits (CE).
02.14 Troubleshoot parallel circuits (CE).
02.15 Apply Ohm's law to series-parallel circuits (CE).
02.16 Construct and verify the operation of series-parallel circuits (CE).
02.17 Troubleshoot series-parallel circuits (CE).
02.18 Identify and define voltage divider circuits (loaded and unloaded) (CE).
02.19 Construct and verify the operation of voltage divider circuits (loaded and unloaded) (CE).
02.20 Troubleshoot voltage divider circuits (loaded and unloaded) (CE).
02.21 Apply maximum power theory (CE).
02.22 Construct and verify the operation of DC circuits that demonstrate the maximum power transfer theory (CE).
02.23 Define magnetic properties of circuits and devices (CE).
02.24 Determine the physical and electrical characteristics of capacitors and inductors (CE).
02.25 Define RC and RL time constants and classify the output of differentiators and integrators (CE).
02.26 Construct and verify the operation of differentiators and integrators to determine RC and RL time constants (CE).
02.27 Troubleshoot differentiator and integrator circuits (CE).
02.28 Set up and operate a VOM for DC circuits (CE).
02.29 Set up and operate a DVM for DC circuits (CE).
02.30 Set up and operate power supplies for DC circuits (CE).
02.21 Set up and operate oscilloscopes for DC circuits (CE).

03.0 DEMONSTRATE PROFICIENCY IN AC CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electronics (prerequisite to AC) (CE).
03.02 Identify properties of an AC signal (CE).
03.03 Identify AC sources (CE).
03.04 Analyze and measure AC signals using oscilloscope, frequency meter, and generator (CE).

03.05 Define the characteristics of AC capacitive circuits (CE).
03.06 Construct and verify the operation of AC capacitive circuits (CE).
03.07 Troubleshoot AC capacitive circuits (CE).
03.08 Define the characteristics of AC inductive circuits (CE).
03.09 Construct and verify the operation of AC inductive circuits (CE).
03.10 Troubleshoot AC inductive circuits (CE).
03.11 Define and apply the principles of transformers to AC circuits (CE).
03.12 Construct and verify the operation of AC circuits utilizing transformers (CE).
03.13 Troubleshoot AC circuits utilizing transformers (CE).
03.14 Define the characteristics of RLC circuits (series, parallel, and complex) (CE).
03.15 Construct and verify the operation of RLC circuits (series, parallel, and complex) (CE).
03.16 Define the characteristics of series and parallel resonant circuits (CE).
03.17 Construct and verify the operation of series and parallel resonant circuits (CE).
03.18 Define the characteristics of filter circuits (CE).
03.19 Construct and verify the operation of filter circuits (CE).
03.20 Troubleshoot filter circuits (CE).
03.21 Define the characteristics of polyphase circuits (CE).
03.22 Define basic motor theory and operation (CE).
03.23 Define basic generator theory and operation (CE).
03.24 Set up and operate a VOM for AC circuits (CE).
03.25 Set up and operate a DVM for AC circuits (CE).
03.26 Set up and operate power supplies for AC circuits (CE).
03.27 Set up and operate oscilloscopes for AC circuits (CE).
03.28 Set up and operate frequency counters for AC circuits (CE).
03.29 Set up and operate signal generators for AC circuits (CE).
03.30 Set up and operate capacitor/inductor analyzers for AC circuits (CE).
03.31 Set up and operate impedance bridges for AC circuits (CE).

04.0 DEMONSTRATE PROFICIENCY IN SOLID-STATE DEVICES--The student will be able to:

04.01 Identify properties of semiconductor materials (CE).
04.02 Identify and define operating characteristics and applications of pn junction diodes (CE).
04.03 Identify and define operating characteristics and applications of special diodes (CE).
04.04 Analyze diode circuits (CE).
04.05 Construct diode circuits (CE).
04.06 Troubleshoot diode circuits (CE).
04.07 Identify and define operating characteristics and applications of bipolar transistors (CE).
04.08 Identify and define operating characteristics and applications of field effect transistors (FET's) (CE).
04.09 Identify and define operating characteristics and applications of thyristors (CE).
04.10 Identify and define operating characteristics and applications of integrated circuits (CE).
04.11 Set up and operate a VOM for solid-state devices (CE).
04.12 Set up and operate a DVM for solid-state devices (CE).
04.13 Set up and operate power supplies for solid-state devices (CE).
04.14 Set up and operate oscilloscopes for solid-state devices (CE).
04.15 Set up and operate frequency counters for solid-state devices (CE).
04.16 Set up and operate signal generators for solid-state devices (CE).
04.17 Set up and operate capacitor/inductor analyzers for solid-state devices (CE).
04.18 Set up and operate impedance bridges for solid-state devices (CE).
04.19 Set up and operate curve tracers (CE).
04.20 Set up and operate transistor testers (CE).

05.0 DEMONSTRATE PROFICIENCY IN ANALOG CIRCUITS--The student will be able to:

05.01 Identify and define operating characteristics and applications of single-stage amplifiers (CE).

05.02 Construct single-stage amplifiers (CE).
05.03 Troubleshoot single-stage amplifiers (CE).
05.04 Identify and define operational characteristics and applications of multistage amplifiers (CE).
05.05 Construct multistage amplifiers (CE).
05.06 Troubleshoot multistage amplifiers (CE).
05.07 Identify and define operating characteristics and applications of basic power supplies and filters (CE).
05.08 Construct basic power supplies and filters (CE).
05.09 Troubleshoot basic power supplies and filters (CE).
05.10 Identify and define operating characteristics and applications of differential and operational amplifiers (CE).
05.11 Construct differential and operational amplifiers (CE).
05.12 Troubleshoot differential and operational amplifiers (CE).
05.13 Identify and define operating characteristics and applications of power supply regulators (CE).
05.14 Construct power supply regulators (CE).
05.15 Troubleshoot power supply regulators (CE).
05.16 Identify and define operating characteristics and applications of active filters (CE).
05.17 Construct active filters (CE).
05.18 Troubleshoot active filters (CE).
05.19 Identify and define operating characteristics and applications of sinusoidal and non-sinusoidal oscillators (CE).
05.20 Construct oscillators (Optional in high school and vocational programs) (CE).
05.21 Troubleshoot oscillators (CE).
05.22 Identify and define operating characteristics and applications of motor phase-control circuits (single-phase and multiphase) (CE).
05.23 Identify and define operating characteristics and applications of cathode ray tubes (CRT's) as used in video terminals (CE).
05.24 Identify and define operating characteristics and applications of optical devices (CE).
05.25 Set up and operate a VOM for analog circuits (CE).
05.26 Set up and operate a DVM for analog circuits (CE).
05.27 Set up and operate power supplies for analog circuits (CE).
05.28 Set up and operate oscilloscopes for analog circuits (CE).
05.29 Set up and operate frequency counters for analog circuits (CE).
05.30 Set up and operate signal generators for analog circuits (CE).
05.31 Set up and operate impedance bridges for analog circuits (CE).

06.0 DEMONSTRATE PROFICIENCY IN DIGITAL DEVICES--The student will be able to:

06.01 Define and apply numbering systems (hex., bin., and oct.)to codes and arithmetic (CE).
06.02 Analyze/minimize logic circuits using Boolean operations (CE).
06.03 Set up and operate a VOM for digital devices (CE).
06.04 Set up and operate DVM for digital devices (CE).
06.05 Set up and operate logic probes for digital devices (CE).
06.06 Set up and operate power supplies for digital devices and solve power distribution and noise problems (CE).
06.07 Set up and operate pulsers for digital devices (CE).
06.08 Set up and operate oscilloscopes for digital devices (CE).
06.09 Set up and operate logic analyzers for digital devices (CE).
06.10 Set up and operate pulse generators for digital devices (CE).
06.11 Set up and operate counters for digital devices (CE).
06.12 Identify types of logic gates and their truth tables (CE).
06.13 Construct logic gates using discrete components (CE).
06.14 Troubleshoot logic gates (CE).
06.15 Identify and define types of flip-flops and their truth and excitation tables (CE).
06.16 Construct flip-flops using discrete components (CE).
06.17 Troubleshoot flip-flops (CE).
06.18 Identify, define, and measure characteristics of integrated-circuit (IC) logic families and electro-static sensitive devices(CE).
06.19 Identify types of registers and counters (CE).
06.20 Construct registers and counters using flip-flops (CE).
06.21 Troubleshoot registers and counters (CE).
06.22 Identify and define clock and timing circuits (CE).
06.23 Construct clock and timing circuits (CE).

06.24 Troubleshoot clock and timing circuits (CE).
06.25 Identify and relate types of logic circuits (CE).
06.26 Construct logic-arithmetic circuits (CE).
06.27 Troubleshoot logic-arithmetic circuits (CE).
06.28 Identify types of encoding and decoding devices (CE).
06.29 Construct encoders and decoders (CE).
06.30 Troubleshoot encoders and decoders (CE).
06.31 Identify multiplexer and demultiplexer circuits (CE).
06.32 Construct multiplexer and demultiplexer circuits (CE).
06.33 Troubleshoot multiplexer and demultiplexer circuits (CE).
06.34 Identify types of memory circuits (static, dynamic, volatile, nonvolatile, and programmable devices, etc.) (CE).
06.35 Use memory devices in circuits (CE).
06.36 Troubleshoot memory-device circuits (CE).
06.37 Relate the uses of digital-to-analog and analog-to-digital conversions (CE).
06.38 Construct digital-to-analog and analog-to-digital circuits (CE).
06.39 Troubleshoot digital-to-analog and analog-to-digital circuits (CE).
06.40 Identify types of displays (LED, LCD, etc.) (CE).
06.41 Construct display circuits (CE).
06.42 Troubleshoot display circuits (CE).
06.43 Analyze representative digital systems (Student Project).
06.44 Design, construct, and troubleshoot representative digital systems (Student Project).
06.45 Demonstrate applications of representative digital systems (Student Project).

07.0 DEMONSTRATE PROFICIENCY IN MICROPROCESSING--The student will be able to:

07.01 Identify CPU (Architecture) building blocks and their uses.
07.02 Analyze BUS concepts (CE).
07.03 Analyze various memory schemes (CE).
07.04 Set up and operate a VOM for microprocessing analysis (CE).
07.05 Set and operate a DVM for microprocessing analysis (CE).
07.06 Set up and operate power supplies for microprocessor use (CE).
07.07 Set up and operate oscilloscopes for microprocessors (CE).
07.08 Set up and operate logic/data analyzers for microprocessor de-bug (CE).
07.09 Identify types of input and output devices and peripherals (PIA's, UART's, etc.) (CE).
07.10 Interface input and output ports (RS-232, RS-422, etc.) (CE).
07.11 Troubleshoot input and output ports (CE).
07.12 Execute computer instruction sets (CE).
07.13 Design and lay out a unique microprocessing system (Student Project).
07.14 Construct a unique microprocessing application system (Student Project).
07.15 Troubleshoot and demonstrate proficiency in a unique application in microprocessor systems (Student Project).
07.16 Construct and troubleshoot a single-chip microprocessor system.
07.17 Construct and troubleshoot an advanced microcomputer system.

08.0 DEMONSTRATE PROFICIENCY IN COMPUTER SYSTEMS ARCHITECTURE--The student will be able to:

08.01 Draw and explain systems configurations in block detail.
08.02 Interpret computer acronyms.
08.03 Identify and define priorities/interrupts at system level.
08.04 Define and list D.M.A. data handling systems (direct memory access).
08.05 Define functions of advanced memory techniques (virtual, pipeline, cache).
08.06 Troubleshoot a microcomputer system.

09.0 DEMONSTRATE PROFICIENCY IN SOFTWARE FUNDAMENTALS--The student will be able to:

09.01 Load and run operating system software.
09.02 Load and run diagnostic software.
09.03 Construct flow charts.

09.04 Analyze flow charts.
09.05 Identify and define computer languages and their uses.
09.06 Write a simple computer program in BASIC.
09.07 Write a computer program in assembly language.
09.08 Write a computer program in machine language.
09.09 Analyze firmware concepts

10.0 DEMONSTRATE AN UNDERSTANDING OF COMMUNICATION INTERFACING--The student will be able to:

10.01 Identify and define EIA, IEEE, and CCITT standards.
10.02 Identify, define and analyze sync devices.
10.03 Identify, define and analyze async devices.
10.04 Identify and define networking levels or layers.
10.05 Identify and define protocols.
10.06 Identify and define packet switching.
10.07 Identify and define multi-user systems.

11.0 DEMONSTRATE AN UNDERSTANDING OF PERIPHERAL EQUIPMENT--The student will be able to:

11.01 List types of card and papertape equipment and interface controllers.
11.02 Analyze and troubleshoot display terminals and interface controllers.
11.03 Analyze and troubleshoot printers and interface controllers.
11.04 Align printers and interface controllers.
11.05 Describe the operation of typical magnetic tape equipment and interface controllers.
11.06 Analyze disk equipment and interface controllers.
11.07 Troubleshoot and repair disk equipment and interface controllers.
11.08 Align disk equipment and interface controllers.
11.09 Define environmental requirements for peripherals/media.

12.0 DEMONSTRATE AN UNDERSTANDING OF CUSTOMER SITE REQUIREMENTS/CONSIDERATIONS --The student will be able to:

12.01 Apply effective relations.
12.02 Follow installation procedures.
12.03 Calculate/determine power requirements.
12.04 Calculate/determine environmental requirements.
12.05 List and perform PM techniques and requirements.

13.0 DEMONSTRATE AN ABILITY TO PERFORM TECHNICAL RECORDING AND REPORTING--The student will be able to:

13.01 Draw and interpret electronic schematics (CE).
13.02 Record data and design curves and graphs (CE).
13.03 Write reports and make oral presentations (CE).
13.04 Maintain test logs (CE).
13.05 Make equipment failure reports (CE).
13.06 Specify and requisition simple electronic components (CE).
13.07 Compose technical letters and memoranda (CE).
13.08 Write formal reports of laboratory experiences (CE).

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents that may be required when applying for a job.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.
14.10 Write a resume.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.

15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Consumer Electronic Product Servicing

CODE NUMBER: Secondary ____________ Postsecondary EST0320

Florida CIP IN47.010301

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS _________

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 13 - 17

CERTIFICATION COVERAGE: TEC ELEC @ 7 Radio TV @ 7 Electronic 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as radio and television repairers (720.281-010), radio repairers (720.281-010), tape recorder repairers (720.281.014), protective signal repairer helpers (822.684014), or antenna installers (823.684-010), computer technician (003.161-018), security system technician (828.281-010).

This program includes many of the competencies applicable to the common core of electronics program and are identified with the designation (CE). The content includes, but is not not limited to communication skills; leadership skills; human relations and employability skills; safe and efficient work practices and laboratory practices, DC electronics and circuits, AC electronics and circuits, solid state devices and circuits, analog circuits, digital devices and circuits, microprocessing, technical recording and reporting audio systems, tape recorders and players, AM/FM tuners, television, and antenna and transmission line systems.

II. LABORATORY ACTIVITIES: Consumer electronic repair laboratory activities are an integral part of this program. The tools, test equipment, materials, consumer related equipment, and processes used in the laboratory are equal to those used in industry. Students will use the various types of precision test equipment found in general use throughout the electronics industry for the purpose of analyzing, troubleshooting, and repairing circuitry as found in audio systems, tape recorders, tuners, televisions, video disc players, master antenna systems and electronic security systems.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communications, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher, and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program the student will be able to:

01. Demonstrate proficiency in laboratory practices.
02. Demonstrate proficiency in DC circuits.
03. Demonstrate proficiency in AC circuits.
04. Demonstrate proficiency in solid state devices
05. Demonstrate proficiency in analog circuits.
06. Demonstrate proficiency in digital devices.
07. Demonstrate proficiency in microprocessing.
08. Demonstrate proficiency repairing radio and television receiving systems.
09. Demonstrate proficiency maintaining video recording and playback systems.
10. Demonstrate proficiency in troubleshooting video disc player systems.
11. Demonstrate proficiency repairing personal computer systems and video games.
12. Demonstrate proficiency in troubleshooting advanced audio systems.
13. Demonstrate proficiency in troubleshooting master antenna television systems.
14. Demonstrate proficiency troubleshooting electronic security systems.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education — SECONDARY NUMBER ____________

PROGRAM TITLE: Consumer Electronic Product Servicing — PROGRAM NUMBER: EST0320

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES --The student will be able to:

01.01 Apply proper OSHA safety standards (CE).
01.02 Make electrical connections (CE).
01.03 Identify and use hand tools properly (CE).
01.04 Identify and use power tools properly (CE).
01.05 Demonstrate acceptable soldering and desoldering techniques.(CE)
01.06 Handle static sensitive devices.
01.07 Utilize mechanical precision measurement devices, such as rulers, calipers, scales, slide rules, etc..

02.0 DEMONSTRATE PROFICIENCY IN DC CIRCUITS--The student will be able to:

02.01 Solve algebraic problems to include exponentials (prerequisite to DC) (CE).
02.02 Relate electricity to the nature of matter (CE).
02.03 Identify sources of electricity (CE).
02.04 Define voltage, current, resistance, power, and energy (CE).
02.05 Apply and relate Ohm's law (CE).
02.06 Read and interpret color codes and symbols to identify electrical components and values. (CE).
02.07 Measure properties of a circuit using VOM and DVM meters (CE).
02.08 Compute and measure conductance and resistance of conductors and insulators (CE).
02.09 Apply Ohm's law to series circuits (CE).
02.10 Construct and verify operation of series circuits (CE).
02.11 Troubleshoot series circuits (CE).
02.12 Apply Ohm's law to parallel circuits (CE).
02.13 Construct and verify the operation of parallel circuits (CE).
02.14 Troubleshoot parallel circuits (CE).
02.15 Apply Ohm's law to series-parallel circuits (CE).
02.16 Construct and verify the operation of series-parallel circuits (CE)
02.17 Troubleshoot series-parallel circuits (CE).
02.18 Identify and define voltage divider circuits (loaded and unloaded).
02.19 Construct and verify the operation of voltage divider circuits (loaded and unloaded) (CE).
02.20 Troubleshoot voltage divider circuits (loaded and unloaded) (CE).
02.21 Apply maximum power theory (CE).
02.22 Construct and verify the operation of DC circuits that demonstrate the maximum power transfer theory (CE).
02.23 Define magnetic properties of circuits and devices (CE).
02.24 Determine the physical and electrical characteristics of capacitors and inductors (CE).
02.25 Define RC and RL time constants and classify the output of differentiators and integrators (CE).
02.26 Construct and verify the operation of differentiators and integrators to determine RC and RL time constants (CE).
02.27 Troubleshoot differentiator and integrator circuits (CE).
02.28 Identify types of DC surface mounted devices (SMD's)
02.29 Identify defective SMD's using appropriate troubleshooting techniques.
02.30 Remove and replace DC SMD's using specialized soldering and desoldering techniques.
02.31 Set up and operate a VOM for DC circuits (CE).
02.32 Set up and operate a DVM for DC circuits (CE).
02.33 Set up and operate power supplies for DC circuits (CE).
02.34 Set up and operate oscilloscopes for DC circuits (CE).

03.0 DEMONSTRATE PROFICIENCY IN AC CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electronics (prerequisite to AC) (CE).
03.02 Identify properties of an AC signal (CE).
03.03 Identify AC sources (CE).

03.04 Analyze and measure AC signals using oscilloscope, frequency meter, and generator (CE).
03.05 Define the characteristics of AC capacitive circuits (CE).
03.06 Construct (or analyze) and verify the operation of AC capacitive circuits (CE).
03.07 Troubleshoot AC capacitive circuits (CE).
03.08 Define the characteristics of AC inductive circuits (CE).
03.09 Construct (or analyze) and verify the operation of AC inductive circuits (CE).
03.10 Troubleshoot AC inductive circuits (CE).
03.11 Define and apply the principles of transformers to AC circuits CE).
03.12 Construct (or analyze) and verify the operation of AC circuits utilizing transformers (CE).
03.13 Troubleshoot AC circuits utilizing transformers (CE).
03.14 Define the characteristics of RLC circuits (series, parallel, and complex) (CE).
03.15 Construct (or analyze) and verify the operation of RLC circuits (series, parallel, and complex) (CE).
03.16 Define the characteristics of series and parallel resonant circuits (CE).
03.17 Construct (or analyze) and verify the operation of series and parallel resonant circuits (CE).
03.18 Define the characteristics of filter circuits (CE).
03.19 Construct (or analyze) and verify the operation of filter circuits (CE).
03.20 Troubleshoot filter circuits (CE).
03.21 Define the characteristics of polyphase circuits.
03.22 Define basic motor theory and operation (CE).
03.23 Define basic generator theory and operation (CE).
03.24 Set up and operate a VOM for AC circuits (CE).
03.25 Set up and operate a DVM for AC circuits (CE).
03.26 Set up and operate power supplies for AC circuits (CE).
03.27 Set up and operate oscilloscopes for AC circuits (CE).
03.28 Set up and operate frequency counters for AC circuits (CE).
03.29 Set up and operate signal generators for AC circuits (CE).
03.30 Set up and operate capacitor/inductor analyzers for AC circuits (CE
03.31 Set up and operate impedance bridges for AC circuits (CE).
03.32 Identify types of AC surface mounted devices (SMD's)
03.33 Identify defective AC SMD's using appropriate troubleshooting techniques .
03.34 Remove and replace AC SMD's using specialized soldering and desoldering techniques.

04.0 DEMONSTRATE PROFICIENCY IN SOLID STATE DEVICES--The student will be able to:

04.01 Identify properties of semiconductor materials (CE).
04.02 Identify and define operating characteristics and applications of pn junction diodes (CE).
04.03 Identify and define operating characteristics and applications of special diodes (CE).
04.04 Analyze diode circuits (CE).
04.05 Construct diode circuits (CE).
04.06 Troubleshoot diode circuits (CE).
04.07 Identify and define operating characteristics and applications of bipolar transistors (CE).
04.08 Identify and define operating characteristics and applications of field effect transistors (FET's) (CE).
04.09 Identify and define operating characteristics and applications of thyristors (CE).
04.10 Identify and define operating characteristics and applications of integrated circuits (CE).
04.11 Set up and operate a VOM for solid state devices (CE).
04.12 Set up and operate a DVM for solid state devices (CE).
04.13 Set up and operate power supplies for solid state devices (CE).
04.14 Set up and operate oscilloscopes for solid state devices (CE).
04.15 Set up and operate frequency counters for solid state devices (CE).
04.16 Set up and operate signal generators for solid state devices (CE).
04.17 Set up and operate capacitor/inductor analyzers for solid state devices (CE).
04.18 Set up and operate impedance bridges for solid state devices (CE).

04.19 Set up and operate curve tracers (CE).
04.20 Set up and operate transistor testers (CE).
04.21 Identify types of solid state surface mounted devices (SMD's).
04.22 Identify defective solid state SMD's using appropriate troubleshooting techniques.
04.23 Remove and replace solid state SMD's using specialized soldering and desoldering techniques.

05.0 DEMONSTRATE PROFICIENCY IN ANALOG CIRCUITS--The student will be able to:

05.01 Identify and define operating characteristics and applications of single stage amplifiers (CE).
05.02 Construct (or analyze) single stage amplifiers (CE).
05.03 Troubleshoot single stage amplifiers (CE).
05.04 Identify and define operational characteristics and applications of multistage amplifiers (CE).
05.05 Construct (or analyze) multistage amplifiers (CE).
05.06 Troubleshoot multistage amplifiers (CE).
05.07 Identify and define operating characteristics and applications of basic power supplies and filters (CE).
05.08 Construct (or analyze) basic power supplies and filters (CE).
05.09 Troubleshoot basic power supplies and filters (CE).
05.10 Identify and define operating characteristics and applications of differential and operational amplifiers (CE).
05.11 Construct (or analyze) differential and operational amplifiers (CE)
05.12 Troubleshoot differential and operational amplifiers (CE).
05.13 Identify and define operating characteristics and applications of power supply regulators (CE).
05.14 Construct (or analyze) power supply regulators (CE).
05.15 Troubleshoot power supply regulators (CE).
05.16 Identify and define operating characteristics and applications of active filters (CE).
05.17 Construct (or analyze) active filters (CE).
05.18 Troubleshoot active filters (CE).
05.19 Identify and define operating characteristics and applications of sinusoidal and non-sinusoidal oscillators (CE).
05.20 Construct (or analyze) oscillators (CE).
05.21 Troubleshoot oscillators (CE).
05.22 Identify and define operating characteristics and applications of motor phase control circuits (single phase and multiphase) (CE).
05.23 Identify and define operating characteristics and applications of cathode ray tubes (CRT's) as used in video terminals (CE).
05.24 Identify and define operating characteristics and applications of optical devices (CE).
05.25 Set up and operate a VOM for analog circuits (CE).
05.26 Set up and operate a DVM for analog circuits (CE).
05.27 Set up and operate power supplies for analog circuits (CE).
05.28 Set up and operate oscilloscopes for analog circuits (CE).
05.29 Set up and operate frequency counters for analog circuits (CE).
05.30 Set up and operate signal generators for analog circuits (CE).
05.31 Set up and operate impedance bridges for analog circuits (CE).

06.0 DEMONSTRATE PROFICIENCY IN DIGITAL DEVICES--The student will be able to:

06.01 Define and apply numbering systems (hex., bin., and oct.)to codes arithmetic (CE).
06.02 Analyze/minimize logic circuits using Boolean operations (CE).
06.03 Set up and operate a DVM for digital devices (CE).
06.04 Set up and operate logic probes for digital devices (CE).
06.05 Set up and operate power supplies for digital devices and solve power distribution and noise problems (CE).
06.06 Set up and operate pulsers for digital devices (CE).
06.07 Set up and operate oscilloscopes for digital devices (CE).
06.08 Set up and operate logic analyzers for digital devices (CE).
06.09 Set up and operate pulse generators for digital devices (CE).
06.10 Set up and operate counters for digital devices (CE).
06.11 Identify types of logic gates and their truth tables (CE).
06.12 Construct (or analyze) logic gates using discrete components (CE).
06.13 Troubleshoot logic gates (CE).

06.14 Identify and define types of flip-flops and their truth and excitation tables (CE).

06.15 Construct (or analyze) flip-flops using discrete components (CE).

06.16 Troubleshoot flip-flops (CE).

06.17 Identify, define, and measure characteristics of integrated-circuit (IC) logic families (CE).

06.18 Identify types of registers and counters (CE).

06.19 Construct (or analyze) registers and counters using flip-flops (CE).

06.20 Troubleshoot registers and counters (CE).

06.21 Identify and define clock and timing circuits (CE).

06.22 Construct (or analyze) clock and timing circuits (CE).

06.23 Troubleshoot clock and timing circuits (CE).

06.24 Identify and relate types of logic circuits (CE).

06.25 Construct (or analyze) logic arithmetic circuits (CE).

06.26 Troubleshoot logic arithmetic circuits (CE).

06.27 Identify types of encoding and decoding devices (CE).

06.28 Construct (or analyze) encoders and decoders (CE).

06.29 Troubleshoot encoders and decoders (CE).

06.30 Identify multiplexer and demultiplexer circuits (CE).

06.31 Construct multiplexer and demultiplexer circuits (CE).

06.32 Troubleshoot multiplexer and demultiplexer circuits (CE).

06.33 Identify types of memory circuits (static, dynamic, volatile, nonvolatile, and programmable devices, etc.) (CE).

06.34 Use memory devices in circuits (CE).

06.35 Troubleshoot memory device circuits (CE).

06.36 Relate the uses of digital-to-analog and analog-to-digital conversions (CE).

06.37 Construct (or analyze) digital-to-analog and analog-to-digital circuits (CE).

06.38 Troubleshoot digital-to-analog and analog-to-digital circuits (CE).

06.39 Identify types of displays (LED, LCD, etc.) (CE).

06.40 Construct (or analyze) display circuits (CE).

06.41 Troubleshoot display circuits (CE).

06.42 Analyze representative digital systems (Class Project) (CE).

06.43 Design, construct, and troubleshoot representative digital systems (Class Project) (CE).

06.44 Demonstrate applications of representative digital systems (Class Project) (CE).

07.00 DEMONSTRATE PROFICIENCY IN MICROPROCESSING--The student will be able to:

07.01 Identify CPU (Architecture) building blocks and their uses.

07.02 Analyze BUS concepts (CE).

07.03 Analyze various memory schemes (CE).

07.04 Set up and operate a DVM for microprocessing analysis (CE).

07.05 Set up and operate power supplies for microprocessor use (CE).

07.06 Set up and operate oscilloscopes for microprocessors (CE).

07.07 Set up and operate logic/data analyzers for microprocessor de-bug (CE).

07.08 Identify types of input and output devices and peripherals (PIA's, UART's, etc.) (CE).

07.09 Interface input and output ports (RS-232, RS-422, etc.) (CE).

07.10 Troubleshoot input and output ports (CE).

07.11 Execute computer instruction sets (CE).

07.12 (Class System Project) Design and lay out a unique microprocessing system.

07.13 (Class System Project) Construct a unique microprocessing application system (CE).

07.14 (Class System Project) Troubleshoot and demonstrate proficiency in a unique application in microprocessor systems (CE).

07.15 Construct and troubleshoot a single chip microprocessor system (CE).

07.16 Construct and troubleshoot an advanced microcomputer system (CE).

08.0 DEMONSTRATE PROFICIENCY IN RADIO & TELEVISION RECEIVING SYSTEMS--The student will be able to:

08.01 Read and interpret radio and television receiving system block and circuit diagrams.
08.02 Determine the operational status of radio and television receiving systems.
08.03 Troubleshoot radio and television receiving systems.
08.04 Remove and replace radio and television receiving system components.
08.05 Perform operating systems check and make minor adjustments to radio and television receiving systems.
08.06 Set up and operate video analyzers.
08.07 Set up and operate NTSC generators.
08.08 Set up and operate CRT analyzers.
08.09 Set up and operate stereo generators.

09.0 DEMONSTRATE PROFICIENCY IN VIDEO RECORDING AND PLAYBACK SYSTEMS (ANALOG AND DIGITAL)--The student will be able to:

09.01 Read and interpret video recording system block and circuit diagrams.
09.02 Determine the operational status of video recording systems (mechanical and electronic).
09.03 Troubleshoot video recording systems.
09.04 Remove and replace video recording system components (CE).
09.05 Perform operating systems check and make minor adjustments to video recording systems.
09.06 Set up and operate BETA test equipment.
09.07 Set up and operate VHS test equipment.
09.08 Set up and operate vectorscopes.

10.0 DEMONSTRATE PROFICIENCY IN VIDEO DISC PLAYER SYSTEMS--The student will be able to:

10.01 Read and interpret video disc player system block and circuit diagrams.
10.02 Determine the operational status of video disc player systems.
10.03 Troubleshoot video-disc player systems (LASER/CED).
10.04 Remove and replace video-disc player system components.
10.05 Perform operating systems checks & make minor adjustments to video-disc player systems.

11.0 DEMONSTRATE PROFICIENCY IN PERSONAL COMPUTER SYSTEMS & VIDEO GAMES--The student will be able to:

11.01 Read & interpret computer system & video game block & circuit diagrams.
11.02 Determine the operational status of personal computer systems and video games.
11.03 Troubleshoot personal computer systems & video games.
11.04 Remove & replace personal computer systems & video game components.
11.05 Perform operating systems check & make minor adjustments to personal computer systems & video games.
11.06 Set up & operate logic analyzers for personal computer systems.

12.0 DEMONSTRATE PROFICIENCY IN ADVANCES AUDIO SYSTEMS (ANALOG & DIGITAL)--The student will be able to:

12.01 Read & interpret advanced audio systems block & circuit diagrams.
12.02 Determine the operational status of advanced audio systems.
12.03 Troubleshoot advanced audio systems.
12.04 Remove & replace advanced audio system components.
12.05 Perform operating systems check & make minor adjustments to advanced audio systems.

13.0 DEMONSTRATE PROFICIENCY IN MASTER ANTENNA TELEVISION SYSTEMS (CATV/CCTV/MATV/SATV)--The student will be able to:

13.01 Design master antenna television receiving systems.
13.02 Determine material requirements for master antenna television receiving systems.
13.03 Prepare bills of material for master antenna television receiving systems.
13.04 Lay out & install master antenna television receiving systems.
13.05 Set up & operate field strength meters.
13.06 Determine the operational status of master- antenna television receiving systems.
13.07 Troubleshoot master antenna television receiving systems.
13.08 Remove & replace master antenna television receiving system components.
13.09 Perform operating systems check & make minor adjustments to master antenna television receiving systems.

14.0 DEMONSTRATE PROFICIENCY IN ELECTRONIC SECURITY SYSTEMS--The student will be able to:

14.01 Lay out & install electronic security systems.
14.02 Determine the operating status of electronic security systems.
14.03 Troubleshoot electronic security systems.
14.04 Remove & replace electronic security system components.
14.05 Perform operating systems check & make minor adjustments to electronic security systems.

15.0 DEMONSTRATE PROFICIENCY IN EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents that may be required when applying for a job .
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
15.07 Identify acceptable work habits .
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

NOTE: (CE) designates common core or electronics competency.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Consumer Electronic Repair

CODE NUMBER: Secondary 8730100 Postsecondary ______

Florida CIP IN47.011301

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 10-12, 21

CERTIFICATION COVERAGE: Radio TV @ 7 Electronic 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as radio and television repairers (720.281-018), audio video repairers (729.281-010), or antenna installers (823.684-010). audiovisual-aids technician (729.281-010), video installer (822.381-018)

This program includes many of the competencies applicable to the common core of electronics program and are identified with the designation(CE). The content includes, but is not not limited to communication skills; leadership skills; human relations and employability skills; safe and efficient work practices and laboratory practices, DC electronics and circuits, AC electronics and circuits, solid state devices and circuits, analog circuits, digital devices and circuits, microprocessing, technical recording and reporting audio systems, AM/FM tuners, television, and antenna systems.

Listed below are the courses that make up this program when offered at the secondary level.

8730110	Consumer Electronic Repair 1
8730120	Consumer Electronic Repair 2
8730130	Consumer Electronic Repair 3
8730140	Consumer Electronic Repair 4
8730150	Consumer Electronic Repair 5
8730160	Consumer Electronic Repair 6

II. LABORATORY ACTIVITIES: Consumer electronic repair laboratory activities are an integral part of this program. The tools, test equipment, materials, consumer related equipment, and processes used in the laboratory are equal to those used in industry. Students will use the various types of precision test equipment found in general use throughout the electronics industry for the purpose of analyzing, troubleshooting, and repairing circuitry as found in audio systems, tape recorders, tuners, and televisions.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communications, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher, and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The common core of electronics competencies are identified with the designation (CE).

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the students' individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program the student will be able to:

01. Demonstrate proficiency in laboratory practices.
02. Demonstrate proficiency in DC circuits.
03. Demonstrate proficiency in AC circuits.
04. Demonstrate proficiency in solid state devices
05. Demonstrate proficiency in analog circuits.
06. Demonstrate proficiency in digital devices.
07. Demonstrate proficiency in microprocessing.
08. Demonstate proficiency repairing radio and television receiving systems.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education SECONDARY NUMBER 8730100
PROGRAM TITLE: Consumer Electronic Repair POSTSECONDARY NUMBER: ______

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES --The student will be able to:

01.01 Apply proper OSHA safety standards (CE).
01.02 Make electrical connections (CE).
01.03 Identify and use hand tools properly (CE).
01.04 Identify and use power tools properly (CE).
01.05 Demonstrate acceptable soldering and desoldering techniques.(CE)
01.06 Handle static sensitive devices.
01.07 Utilize mechanical precision measurement devices, such as rulers, calipers, scales, slide rules, etc..

02.0 DEMONSTRATE PROFICIENCY IN DC CIRCUITS--The student will be able to:

02.01 Solve algebraic problems to include exponentials (prerequisite to DC) (CE).
02.02 Relate electricity to the nature of matter (CE).
02.03 Identify sources of electricity (CE).
02.04 Define voltage, current, resistance, power, and energy (CE).
02.05 Apply and relate Ohm's law (CE).
02.06 Read and interpret color codes and symbols to identify electrical components and values. (CE).
02.07 Measure properties of a circuit using VOM and DVM meters (CE).
02.08 Compute and measure conductance and resistance of conductors and insulators (CE).
02.09 Apply Ohm's law to series circuits (CE).
02.10 Construct and verify operation of series circuits (CE).
02.11 Troubleshoot series circuits (CE).
02.12 Apply Ohm's law to parallel circuits (CE).
02.13 Construct and verify the operation of parallel circuits (CE).
02.14 Troubleshoot parallel circuits (CE).
02.15 Apply Ohm's law to series-parallel circuits (CE).
02.16 Construct and verify the operation of series-parallel circuits (CE)
02.17 Troubleshoot series-parallel circuits (CE).
02.18 Identify and define voltage divider circuits (loaded and unloaded).
02.19 Construct and verify the operation of voltage divider circuits (loaded and unloaded) (CE).
02.20 Troubleshoot voltage divider circuits (loaded and unloaded) (CE).
02.21 Apply maximum power theory (CE).
02.22 Construct and verify the operation of DC circuits that demonstrate the maximum power transfer theory (CE).
02.23 Define magnetic properties of circuits and devices (CE).
02.24 Determine the physical and electrical characteristics of capacitors and inductors (CE).
02.25 Define RC and RL time constants and classify the output of differentiators and integrators (CE).
02.26 Construct and verify the operation of differentiators and integrators to determine RC and RL time constants (CE).
02.27 Troubleshoot differentiator and integrator circuits (CE).
02.28 Set up and operate a VOM for DC circuits (CE).
02.29 Set up and operate a DVM for DC circuits (CE).
02.30 Set up and operate power supplies for DC circuits (CE).
02.31 Set up and operate oscilloscopes for DC circuits (CE).
02.32 Identify types of DC surface mounted devices (SMD's)
02.33 Identify defective SMD's using appropriate troubleshooting techniques.
02.34 Remove and replace DC SMD's using specialized soldering and desoldering techniques.

03.0 DEMONSTRATE PROFICIENCY IN AC CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electronics (prerequisite to AC) (CE).
03.02 Identify properties of an AC signal (CE).
03.03 Identify AC sources (CE).

03.04 Analyze and measure AC signals using oscilloscope, frequency meter, and generator (CE).
03.05 Define the characteristics of AC capacitive circuits (CE).
03.06 Construct and verify the operation of AC capacitive circuits (CE).
03.07 Troubleshoot AC capacitive circuits (CE).
03.08 Define the characteristics of AC inductive circuits (CE).
03.09 Construct and verify the operation of AC inductive circuits (CE).
03.10 Troubleshoot AC inductive circuits (CE).
03.11 Define and apply the principles of transformers to AC circuits CE).
03.12 Construct and verify the operation of AC circuits utilizing transformers (CE).
03.13 Troubleshoot AC circuits utilizing transformers (CE).
03.14 Define the characteristics of RLC circuits (series, parallel, and complex) (CE).
03.15 Construct and verify the operation of RLC circuits (series, parallel, and complex) (CE).
03.16 Define the characteristics of series and parallel resonant circuits (CE).
03.17 Construct and verify the operation of series and parallel resonant circuits (CE).
03.18 Define the characteristics of filter circuits (CE).
03.19 Construct and verify the operation of filter circuits (CE).
03.20 Troubleshoot filter circuits (CE).
03.21 Define the characteristics of polyphase circuits.
03.22 Define basic motor theory and operation (CE).
03.23 Define basic generator theory and operation (CE).
03.24 Set up and operate a VOM for AC circuits (CE).
03.25 Set up and operate a DVM for AC circuits (CE).
03.26 Set up and operate power supplies for AC circuits (CE).
03.27 Set up and operate oscilloscopes for AC circuits (CE).
03.28 Set up and operate frequency counters for AC circuits (CE).
03.29 Set up and operate signal generators for AC circuits (CE).
03.30 Set up and operate capacitor/inductor analyzers for AC circuits (CE
03.31 Set up and operate impedance bridges for AC circuits (CE).
03.32 Identify types of AC surface-mounted devices (SMD's)
03.33 Identify defective AC SMD's using appropriate troubleshooting techniques .
03.34 Remove and replace AC SMD's using specialized soldering and desoldering techniques.

04.0 DEMONSTRATE PROFICIENCY IN SOLID STATE DEVICES--The student will be able to:

04.01 Identify properties of semiconductor materials (CE).
04.02 Identify and define operating characteristics and applications of pn junction diodes (CE).
04.03 Identify and define operating characteristics and applications of special diodes (CE).
04.04 Analyze diode circuits (CE).
04.05 Construct diode circuits (CE).
04.06 Troubleshoot diode circuits (CE).
04.07 Identify and define operating characteristics and applications of bipolar transistors (CE).
04.08 Identify and define operating characteristics and applications of field effect transistors (FET's) (CE).
04.09 Identify and define operating characteristics and applications of thyristors (CE).
04.10 Identify and define operating characteristics and applications of integrated circuits (CE).
04.11 Set up and operate a VOM for solid-state devices (CE).
04.12 Set up and operate a DVM for solid-state devices (CE).
04.13 Set up and operate power supplies for solid-state devices (CE).
04.14 Set up and operate oscilloscopes for solid-state devices (CE).
04.15 Set up and operate frequency counters for solid-state devices (CE).
04.16 Set up and operate signal generators for solid-state devices (CE).
04.17 Set up and operate capacitor/inductor analyzers for solid-state devices (CE).
04.18 Set up and operate impedance bridges for solid-state devices (CE).

04.19 Set up and operate curve tracers (CE).

04.20 Set up and operate transistor testers (CE).

04.21 Identify types of solid state surface mounted devices (SMD's).

04.22 Identify defective solid state SMD's using appropriate troubleshooting techniques.

04.23 Remove and replace solid state SMD's using specialized soldering and desoldering techniques.

05.0 DEMONSTRATE PROFICIENCY IN ANALOG CIRCUITS--The student will be able to:

05.01 Identify and define operating characteristics and applications of single-stage amplifiers (CE).

05.02 Construct single-stage amplifiers (CE).

05.03 Troubleshoot single-stage amplifiers (CE).

05.04 Identify and define operational characteristics and applications of multistage amplifiers (CE).

05.05 Construct multistage amplifiers (CE).

05.06 Troubleshoot multistage amplifiers (CE).

05.07 Identify and define operating characteristics and applications of basic power supplies and filters (CE).

05.08 Construct basic power supplies and filters (CE).

05.09 Troubleshoot basic power supplies and filters (CE).

05.10 Identify and define operating characteristics and applications of differential and operational amplifiers (CE).

05.11 Construct differential and operational amplifiers (CE).

05.12 Troubleshoot differential and operational amplifiers (CE).

05.13 Identify and define operating characteristics and applications of power supply regulators (CE).

05.14 Construct power supply regulators (CE).

05.15 Troubleshoot power supply regulators (CE).

05.16 Identify and define operating characteristics and applications of active filters (CE).

05.17 Construct active filters (CE).

05.18 Troubleshoot active filters (CE).

05.19 Identify and define operating characteristics and applications of sinusoidal and non-sinusoidal oscillators (CE).

05.20 Construct oscillators (CE).

05.21 Troubleshoot oscillators (CE).

05.22 Identify and define operating characteristics and applications of motor phase-control circuits (single-phase and multiphase) (CE).

05.23 Identify and define operating characteristics and applications of cathode ray tubes (CRT's) as used in video terminals (CE).

05.24 Identify and define operating characteristics and applications of optical devices (CE).

05.25 Set up and operate a VOM for analog circuits (CE).

05.26 Set up and operate a DVM for analog circuits (CE).

05.27 Set up and operate power supplies for analog circuits (CE).

05.28 Set up and operate oscilloscopes for analog circuits (CE).

05.29 Set up and operate frequency counters for analog circuits (CE).

05.30 Set up and operate signal generators for analog circuits (CE).

05.31 Set up and operate impedance bridges for analog circuits (CE).

06.0 DEMONSTRATE PROFICIENCY IN DIGITAL DEVICES--The student will be able to:

06.01 Define and apply numbering systems (hex., bin., and oct.)to codes arithmetic (CE).

06.02 Analyze/minimize logic circuits using Boolean operations (CE).

06.03 Set up and operate a VOM for digital devices (CE).

06.04 Set up and operate a DVM for digital devices (CE).

06.05 Set up and operate logic probes for digital devices (CE).

06.06 Set up and operate power supplies for digital devices and solve power distribution and noise problems (CE).

06.07 Set up and operate pulsers for digital devices (CE).

06.08 Set up and operate oscilloscopes for digital devices (CE).

06.09 Set up and operate logic analyzers for digital devices (CE).

06.10 Set up and operate pulse generators for digital devices (CE).

06.11 Set up and operate counters for digital devices (CE).

06.12 Identify types of logic gates and their truth tables (CE).

06.13 Construct logic gates using discrete components (CE).

06.14 Troubleshoot logic gates (CE).
06.15 Identify and define types of flip-flops and their truth and excitation tables (CE).
06.16 Construct flip-flops using discrete components (CE).
06.17 Troubleshoot flip-flops (CE).
06.18 Identify, define, and measure characteristics of integrated-circuit (IC) logic families (CE).
06.19 Identify types of registers and counters (CE).
06.20 Construct registers and counters using flip-flops (CE).
06.21 Troubleshoot registers and counters (CE).
06.22 Identify and define clock and timing circuits (CE).
06.23 Construct clock and timing circuits (CE).
06.24 Troubleshoot clock and timing circuits (CE).
06.25 Identify and relate types of logic-circuits (CE).
06.26 Construct logic-arithmetic circuits (CE).
06.27 Troubleshoot logic-arithmetic circuits (CE).
06.28 Identify types of encoding and decoding devices (CE).
06.29 Construct encoders and decoders (CE).
06.30 Troubleshoot encoders and decoders (CE).
06.31 Identify multiplexer and demultiplexer circuits (CE)..
06.32 Construct multiplexer and demultiplexer circuits (CE).
06.33 Troubleshoot multiplexer and demultiplexer circuits (CE).
06.34 Identify types of memory circuits (static, dynamic, volatile, nonvolatile, and programmable devices, etc.) (CE).
06.35 Use memory devices in circuits (CE).
06.36 Troubleshoot memory-device circuits (CE).
06.37 Relate the uses of digital-to-analog and analog-to-digital conversions (CE)..
06.38 Construct digital-to-analog and analog-to-digital circuits (CE).
06.39 Troubleshoot digital-to-analog and analog-to-digital circuits(CE).
06.40 Identify types of displays (LED, LCD, etc.) (CE).
06.41 Construct display circuits (CE).
06.42 Troubleshoot display circuits (CE).

07.00 DEMONSTRATE PROFICIENCY IN MICROPROCESSING--The student will be able to:

07.01 Identify CPU (Architecture) building blocks and their uses.
07.02 Analyze BUS concepts (CE).
07.03 Analyze various memory schemes (CE).
07.04 Set up and operate a VOM for microprocessing analysis (CE).
07.05 Set up and operate a DVM for microprocessing analysis (CE).
07.06 Set up and operate power supplies for microprocessor use (CE).
07.07 Set up and operate oscilloscopes for microprocessors (CE).
07.08 Set up and operate logic/data analyzers for microprocessor de-bug (CE).
07.09 Identify types of input and output devices and peripherals (PIA's, UART's, etc.) (CE).
07.10 Interface input and output ports (RS-232, RS-422, etc.) (CE).
07.11 Troubleshoot input and output ports (CE).
07.12 Execute computer instruction sets (CE).

08.0 DEMONSTRATE PROFICIENCY IN RADIO & TELEVISION RECEIVING SYSTEMS--The student will be able to:

08.01 Read and interpret radio and television receiving system block and circuit diagrams.
08.02 Determine the operational status of radio and television receiving systems.
08.03 Troubleshoot radio and television receiving systems.
08.04 Remove and replace radio and television receiving system components.
08.05 Perform operating systems check and make minor adjustments to radio and television receiving systems.
08.06 Set up and operate video analyzers.
08.07 Set up and operate NTSC generators.
08.08 Set up and operate CRT analyzers.
08.09 Set up and operate stereo generators.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents that may be required when applying for a job .
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
09.07 Identify acceptable work habits .
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

NOTE: (CE) designates common core or electronics competency.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Consumer Electronic Repair PROGRAM NUMBER: 8730100

COURSE TITLE: Consumer Electronic Repair 1 COURSE NUMBER: 8730110

COURSE DESCRIPTION:

This course is designed to provide instruction in laboratory practices and DC circuits.

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES --The student will be able to:

01.01 Apply proper OSHA safety standards (CE).
01.02 Make electrical connections (CE).
01.03 Identify and use hand tools properly (CE).
01.04 Identify and use power tools properly (CE).
01.05 Demonstrate acceptable soldering and desoldering techniques.(CE)
01.06 Handle static sensitive devices.
01.07 Utilize mechanical precision measurement devices, such as rulers, calipers, scales, slide rules, etc..

02.0 DEMONSTRATE PROFICIENCY IN DC CIRCUITS--The student will be able to:

02.01 Solve algebraic problems to include exponentials (prerequisite to DC) (CE).
02.02 Relate electricity to the nature of matter (CE).
02.03 Identify sources of electricity (CE).
02.04 Define voltage, current, resistance, power, and energy (CE).
02.05 Apply and relate Ohm's law (CE).
02.06 Read and interpret color codes and symbols to identify electrical components and values. (CE).
02.07 Measure properties of a circuit using VOM and DVM meters (CE).
02.08 Compute and measure conductance and resistance of conductors and insulators (CE).
02.09 Apply Ohm's law to series circuits (CE).
02.10 Construct and verify operation of series circuits (CE).
02.11 Troubleshoot series circuits (CE).
02.12 Apply Ohm's law to parallel circuits (CE).
02.13 Construct and verify the operation of parallel circuits (CE).
02.14 Troubleshoot parallel circuits (CE).
02.15 Apply Ohm's law to series-parallel circuits (CE).
02.16 Construct and verify the operation of series-parallel circuits (CE
02.17 Troubleshoot series-parallel circuits (CE).
02.18 Identify and define voltage divider circuits (loaded and unloaded).
02.19 Construct and verify the operation of voltage divider circuits (loaded and unloaded) (CE).
02.20 Troubleshoot voltage divider circuits (loaded and unloaded) (CE).
02.21 Apply maximum power theory (CE).
02.22 Construct and verify the operation of DC circuits that demonstrate the maximum power transfer theory (CE).
02.23 Define magnetic properties of circuits and devices (CE).
02.24 Determine the physical and electrical characteristics of capacitors and inductors (CE).
02.25 Define RC and RL time constants and classify the output of differentiators and integrators (CE).
02.26 Construct and verify the operation of differentiators and integrators to determine RC and RL time constants (CE).
02.27 Troubleshoot differentiator and integrator circuits (CE).
02.28 Set up and operate a VOM for DC circuits (CE).
02.29 Set up and operate a DVM for DC circuits (CE).
02.30 Set up and operate power supplies for DC circuits (CE).
02.31 Set up and operate oscilloscopes for DC circuits (CE).
02.32 Identify types of DC surface mounted devices (SMD's)
02.33 Identify defective SMD's using appropriate troubleshooting techniques.
02.34 Remove and replace DC SMD's using specialized soldering and desoldering techniques.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education — COURSE CREDIT: 1

PROGRAM TITLE: Consumer Electronic Repair — PROGRAM NUMBER: 8730100

COURSE TITLE: Consumer Electronic Repair 2 — COURSE NUMBER: 8730120

COURSE DESCRIPTION:

This course is designed to provide instruction in AC circuits.

03.0 DEMONSTRATE PROFICIENCY IN AC CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electronics (prerequisite to AC) (CE).
03.02 Identify properties of an AC signal (CE).
03.03 Identify AC sources (CE).
03.04 Analyze and measure AC signals using oscilloscope, frequency meter, and generator (CE).
03.05 Define the characteristics of AC capacitive circuits (CE).
03.06 Construct and verify the operation of AC capacitive circuits (CE).
03.07 Troubleshoot AC capacitive circuits (CE).
03.08 Define the characteristics of AC inductive circuits (CE).
03.09 Construct and verify the operation of AC inductive circuits (CE).
03.10 Troubleshoot AC inductive circuits (CE).
03.11 Define and apply the principles of transformers to AC circuits CE)
03.12 Construct and verify the operation of AC circuits utilizing transformers (CE).
03.13 Troubleshoot AC circuits utilizing transformers (CE).
03.14 Define the characteristics of RLC circuits (series, parallel, and complex) (CE).
03.15 Construct and verify the operation of RLC circuits (series, parallel, and complex) (CE).
03.16 Define the characteristics of series and parallel resonant circuits (CE).
03.17 Construct and verify the operation of series and parallel resonant circuits (CE).
03.18 Define the characteristics of filter circuits (CE).
03.19 Construct and verify the operation of filter circuits (CE).
03.20 Troubleshoot filter circuits (CE).
03.21 Define the characteristics of polyphase circuits.
03.22 Define basic motor theory and operation (CE).
03.23 Define basic generator theory and operation (CE).
03.24 Set up and operate a VOM for AC circuits (CE).
03.25 Set up and operate a DVM for AC circuits (CE).
03.26 Set up and operate power supplies for AC circuits (CE).
03.27 Set up and operate oscilloscopes for AC circuits (CE).
03.28 Set up and operate frequency counters for AC circuits (CE).
03.29 Set up and operate signal generators for AC circuits (CE).
03.30 Set up and operate capacitor/inductor analyzers for AC circuits (C
03.31 Set up and operate impedance bridges for AC circuits (CE).
03.32 Identify types of AC surface mounted devices (SMD's)
03.33 Identify defective AC SMD's using appropriate troubleshooting techniques .
03.34 Remove and replace AC SMD's using specialized soldering and desoldering techniques.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education — COURSE CREDIT: 1

PROGRAM TITLE: Consumer Electronic Repair — PROGRAM NUMBER: 8730100

COURSE TITLE: Consumer Electronic Repair 3 — COURSE NUMBER: 8730130

COURSE DESCRIPTION:

This course is designed to provide instruction in solid state devices and analog circuits.

04.0 DEMONSTRATE PROFICIENCY IN SOLID STATE DEVICES--The student will be able to:

04.01 Identify properties of semiconductor materials (CE).
04.02 Identify and define operating characteristics and applications of pn junction diodes (CE).
04.03 Identify and define operating characteristics and applications of special diodes (CE).
04.04 Analyze diode circuits (CE).
04.05 Construct diode circuits (CE).
04.06 Troubleshoot diode circuits (CE).
04.07 Identify and define operating characteristics and applications of bipolar transistors (CE).
04.08 Identify and define operating characteristics and applications of field effect transistors (FET's) (CE).
04.09 Identify and define operating characteristics and applications of thyristors (CE).
04.10 Identify and define operating characteristics and applications of integrated circuits (CE).
04.11 Set up and operate a VOM for solid state devices (CE).
04.12 Set up and operate a DVM for solid state devices (CE).
04.13 Set up and operate power supplies for solid state devices (CE).
04.14 Set up and operate oscilloscopes for solid state devices (CE).
04.15 Set up and operate frequency counters for solid state devices (CE)
04.16 Set up and operate signal generators for solid state devices (CE).
04.17 Set up and operate capacitor/inductor analyzers for solid state devices (CE).
04.18 Set up and operate impedance bridges for solid state devices (CE).
04.19 Set up and operate curve tracers (CE).
04.20 Set up and operate transistor testers (CE).
04.21 Identify types of solid state surface mounted devices (SMD's).
04.22 Identify defective solid state SMD's using appropriate troubleshooting techniques.
04.23 Remove and replace solid state SMD's using specialized soldering and desoldering techniques.

05.0 DEMONSTRATE PROFICIENCY IN ANALOG CIRCUITS--The student will be able to:

05.01 Identify and define operating characteristics and applications of single state amplifiers (CE).
05.02 Construct single state amplifiers (CE).
05.03 Troubleshoot single state amplifiers (CE).
05.04 Identify and define operational characteristics and applications of multistage amplifiers (CE).
05.05 Construct multistage amplifiers (CE).
05.06 Troubleshoot multistage amplifiers (CE).
05.07 Identify and define operating characteristics and applications of basic power supplies and filters (CE).
05.08 Construct basic power supplies and filters (CE).
05.09 Troubleshoot basic power supplies and filters (CE).
05.10 Identify and define operating characteristics and applications of differential and operational amplifiers (CE).
05.11 Construct differential and operational amplifiers (CE).
05.12 Troubleshoot differential and operational amplifiers (CE).
05.13 Identify and define operating characteristics and applications of power supply regulators (CE).
05.14 Construct power supply regulators (CE).
05.15 Troubleshoot power supply regulators (CE).
05.16 Identify and define operating characteristics and applications of active filters (CE).
05.17 Construct active filters (CE).
05.18 Troubleshoot active filters (CE).
05.19 Identify and define operating characteristics and applications of sinusoidal and non-sinusoidal oscillators (CE).
05.20 Construct oscillators (CE).
05.21 Troubleshoot oscillators (CE).
05.22 Identify and define operating characteristics and applications of motor phase-control circuits (single-phase and multiphase) (CE).
05.23 Identify and define operating characteristics and applications of cathode ray tubes (CRT's) as used in video terminals (CE).

05.24 Identify and define operating characteristics and applications of optical devices (CE).
05.25 Set up and operate a VOM for analog circuits (CE).
05.26 Set up and operate a DVM for analog circuits (CE).
05.27 Set up and operate power supplies for analog circuits (CE).
05.28 Set up and operate oscilloscopes for analog circuits (CE).
05.29 Set up and operate frequency counters for analog circuits (CE).
05.30 Set up and operate signal generators for analog circuits (CE).
05.31 Set up and operate impedance bridges for analog circuits (CE).

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1987
PROGRAM AREA:	Industrial Education	COURSE CREDIT:	1
PROGRAM TITLE:	Consumer Electronic Repair	PROGRAM NUMBER:	8730100
COURSE TITLE:	Consumer Electronic Repair 4	COURSE NUMBER:	8730140

COURSE DESCRIPTION:

This course is designed to provide instruction in digital devices.

06.0 DEMONSTRATE PROFICIENCY IN DIGITAL DEVICES--The student will be able to:

06.01 Define and apply numbering systems (hex., bin., and oct.)to codes arithmetic (CE).
06.02 Analyze/minimize logic circuits using Boolean operations (CE).
06.03 Set up and operate a VOM for digital devices (CE).
06.04 Set up and operate a DVM for digital devices (CE).
06.05 Set up and operate logic probes for digital devices (CE).
06.06 Set up and operate power supplies for digital devices and solve power distribution and noise problems (CE).
06.07 Set up and operate pulsers for digital devices (CE).
06.08 Set up and operate oscilloscopes for digital devices (CE).
06.09 Set up and operate logic analyzers for digital devices (CE).
06.10 Set up and operate pulse generators for digital devices (CE).
06.11 Set up and operate counters for digital devices (CE).
06.12 Identify types of logic gates and their truth tables (CE).
06.13 Construct logic gates using discrete components (CE).
06.14 Troubleshoot logic gates (CE).
06.15 Identify and define types of flip-flops and their truth and excitation tables (CE).
06.16 Construct flip-flops using discrete components (CE).
06.17 Troubleshoot flip-flops (CE).
06.18 Identify, define, and measure characteristics of integrated-circuit (IC) logic families (CE).
06.19 Identify types of registers and counters (CE).
06.20 Construct registers and counters using flip-flops (CE).
06.21 Troubleshoot registers and counters (CE).
06.22 Identify and define clock and timing circuits (CE).
06.23 Construct clock and timing circuits (CE).
06.24 Troubleshoot clock and timing circuits (CE).
06.25 Identify and relate types of logic circuits (CE).
06.26 Construct logic arithmetic circuits (CE).
06.27 Troubleshoot logic arithmetic circuits (CE).
06.28 Identify types of encoding and decoding devices (CE).
06.29 Construct encoders and decoders (CE).
06.30 Troubleshoot encoders and decoders (CE).
06.31 Identify multiplexer and demultiplexer circuits (CE)..
06.32 Construct multiplexer and demultiplexer circuits (CE).
06.33 Troubleshoot multiplexer and demultiplexer circuits (CE).
06.34 Identify types of memory circuits (static, dynamic, volatile, nonvolatile, and programmable devices, etc.) (CE).
06.35 Use memory devices in circuits (CE).
06.36 Troubleshoot memory device circuits (CE).
06.37 Relate the uses of digital-to-analog and analog-to-digital conversions (CE)..
06.38 Construct digital-to-analog and analog-to-digital circuits (CE).

Consumer Electronic Repair 4 - Continued

06.39 Troubleshoot digital-to-analog and analog-to-digital circuits (CE).
06.40 Identify types of displays (LED, LCD, etc.) (CE).
06.41 Construct display circuits (CE).
06.42 Troubleshoot display circuits (CE).

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education — COURSE CREDIT: 1

PROGRAM TITLE: Consumer Electronic Repair — PROGRAM NUMBER: 8730100

COURSE TITLE: Consumer Electronic Repair 5 — COURSE NUMBER: 8730150

COURSE DESCRIPTION:

This course is designed to provide instruction in microprocessors and DC circuits.

07.00 DEMONSTRATE PROFICIENCY IN MICROPROCESSING--The student will be able to:

07.01 Identify CPU (Architecture) building blocks and their uses.
07.02 Analyze BUS concepts (CE).
07.03 Analyze various memory schemes (CE).
07.04 Set up and operate a VOM for microprocessing analysis (CE).
07.05 Set up and operate a DVM for microprocessing analysis (CE).
07.06 Set up and operate power supplies for microprocessor use (CE).
07.07 Set up and operate oscilloscopes for microprocessors (CE).
07.08 Set up and operate logic/data analyzers for microprocessor de-bug (CE).
07.09 Identify types of input and output devices and peripherals (PIA's, UART's, etc.) (CE).
07.10 Interface input and output ports (RS-232, RS-422, etc.) (CE).
07.11 Troubleshoot input and output ports (CE).
07.12 Execute computer instruction sets (CE).

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education — COURSE CREDIT: 1

PROGRAM TITLE: Consumer Electronic Repair — PROGRAM NUMBER: 8730100

COURSE TITLE: Consumer Electronic Repair 6 — COURSE NUMBER: 8730160

COURSE DESCRIPTION:

This course is designed to provide instruction in repairing radio and television receiving systems, employabiity skills and entrepreneurship.

08.0 DEMONSTRATE PROFICIENCY IN RADIO & TELEVISION RECEIVING SYSTEMS--The student will be able to:

08.01 Read and interpret radio and television receiving system block and circuit diagrams.
08.02 Determine the operational status of radio and television receiving systems.
08.03 Troubleshoot radio and television receiving systems.
08.04 Remove and replace radio and television receiving system components.
08.05 Perform operating systems check and make minor adjustments to radio and television receiving systems.
08.06 Set up and operate video analyzers.
08.07 Set up and operate NTSC generators.
08.08 Set up and operate CRT analyzers.
08.09 Set up and operate stereo generators.

Consumer Electronic Repair 6 - Continued

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents that may be required when applying for a job.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
09.07 Identify acceptable work habits .
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

NOTE: (CE) designates common core or electronics competency.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Cosmetology

CODE NUMBER: Secondary 8757000 Postsecondary COS0996

Florida CIP IN12.040300

SECONDARY SCHOOL CREDITS 8 COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVEL(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 10-12, 13-15, 21

CERTIFICATION COVERAGE: COSMETOL 7 PERS SERV @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare a person for employment as cosmetologists (70082001) or to provide supplemental training for persons previously or currently employed in this occupation. Instruction is designed to qualify students for employment upon successfully passing the Florida cosmetology license examination.

The content includes, but is not limited to, communication skills, leadership skills, human relations skills and employability skills, safe and efficient work practices; Florida cosmetology law and rules, acquisition of knowledge of cosmetology and its related chemistry, bacteriology, anatomy and physiology; development of skill in performing the manipulative technique required in the practice of cosmetology.

Listed below are the courses that comprise this program when offered at the secondary level:

8757010	Cosmetology 1
8757020	Cosmetology 2
8757030	Cosmetology 3
8757040	Cosmetology 4
8757050	Cosmetology 5
8757060	Cosmetology 6
8757070	Cosmetology 7
8757080	Cosmetology 8

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with chemicals, implements, and equipment appropriate to the programs' content and in accordance with current practices in the trade.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The length of this program is 1200 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Employ proper laboratory practices.
02. Perform hair shampooing.
03. Identify and perform scalp treatments.
04. Identify and perform hair shaping.
05. Identify and perform hair styling.
06. Identify and prepare wigs and hair pieces.

07. Identify and perform permanent waving/chemical hair restructuring (relaxing).
08. Identify and perform hair color rinse, semi-permanent color, tinting and bleaching.
09. Identify and perform manicure and pedicure.
10. Identify and perform facials, massage, and make-up.
11. Demonstrate beauty salon management skills.
12. Demonstrate employability skills.
13. Demonstrate knowledge of state board requirements.
14. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS | EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial | SECONDARY NUMBER: 8757000

PROGRAM TITLE: Cosmetology | POSTSECONDARY NUMBER: COS0996

01.0 EMPLOY PROPER LABORATORY PRACTICES--The student will be able to:

01.01 Observe and apply sanitation and shop safety rules and practices to all skill procedures.
01.02 Set up and operate equipment and materials.
01.03 Clean and maintain personal tools and equipment.
01.04 Demonstrate professional ethics with customers and co-workers.

02.0 PERFORM HAIR SHAMPOOING--The student will be able to:

02.01 Prepare the patron.
02.02 Diagnose and recognize hair and scalp condition.
02.03 Select appropriate shampoo products.
02.04 Apply shampoo and manipulate to cleanse hair and scalp.
02.05 Rinse shampoo from hair and scalp.
02.06 Select appropriate conditioner.
02.07 Apply conditioners and rinse (if necessary).
02.08 Towel-blot the hair.

03.0 IDENTIFY AND PERFORM SCALP TREATMENT--The student will be able to:

03.01 Prepare the patron.
03.02 Diagnose and Recognize hair and scalp condition.
03.03 Select appropriate treatment.
03.04 Apply treatment according to manufacturer specifications.
03.05 Perform scalp manipulative techniques.
03.06 Remove treatment.
03.07 Set up and operate electrical treatment equipment.

04.0 IDENTIFY AND PERFORM HAIR SHAPING--The student will be able to:

04.01 Prepare the patron.
04.02 Determine customer desires and needs (basic/style).
04.03 Select proper hair-cutting implements (scissors, razors, thinning shears).
04.04 Section hair and cut guidelines.
04.05 Proceed with desired hair cut.
04.06 Check completed hair cut.

05.0 IDENTIFY AND PERFORM HAIR STYLING--The student will be able to:

05.01 Prepare the patron and determine desired style.
05.02 Prepare and perform wet set using principles of design (finger waves, pin curls, or rollers).
05.03 Prepare and perform heat styling using either blow dryers, curling irons, straightening combs, pressing irons, or electric rollers.
05.04 Comb into style.

06.0 IDENTIFY AND PREPARE WIGS AND HAIR PIECES--The student will be able to:

06.01 Determine and identify styles and colors of wigs and hair pieces.
06.02 Measure the head and fit wig or hair piece.
06.03 Clean, shape, and style to patron's features.

07.0 IDENTIFY AND PERFORM PERMANENT WAVING/CHEMICAL HAIR RESTRUCTURING (RELAXING)--The student will be able to:

Permanent Waving

07.01 Prepare the patron and analyze hair.
07.02 Determine customer desires and needs.
07.03 Select appropriate perm solutions and rod size and follow manufacturer instructions.
07.04 Perform pre-permanent shampoo and shaping.
07.05 Section and wrap hair properly.
07.06 Apply protective cream or lotion; apply cotton to hairline.
07.07 Apply perm solution and process; take test curls.
07.08 Rinse, blot, and neutralize; rinse again.
07.09 Remove rods, condition, and style; record results.

Chemical Hair Restructuring (Relaxing)

07.10 Prepare the patron.
07.11 Analyze hair and scalp.
07.12 Section and apply chemical according to manufacturing directions.
07.13 Test for desired results.
07.14 Rinse, shampoo and style.

08.0 IDENTIFY AND PERFORM HAIR COLOR RINSE, SEMI-PERMANENT COLOR, TINTING AND BLEACHING--The student will be able to:

08.01 Prepare the patron.
08.02 Analyze scalp and hair.
08.03 Determine customer desires and needs.
08.04 Perform and analyze patch test.
08.05 Perform strand test.
08.06 Assemble supplies and equipment.
08.07 Section hair.
08.08 Apply tint or bleach.

Color rinse or Semi-Permanent Color

08.09 Prepare colorrinse or semi-permanent color.
08.10 Shampoo patron.
08.11 Apply process according to manufacturer's directions.
08.12 Process.
08.13 Condition if needed.
08.14 Style; record results.

Permanent Coloring/Tinting

08.15 Prepare tint.
08.16 Apply selected tint for retouch or virgin hair.
08.17 Process, rinse, and shampoo.
08.18 Condition, if needed.
08.19 Style; record results.

Bleaching and Toning

08.20 Prepare bleach.
08.21 Apply bleach for retouch or virgin hair.
08.22 Process, rinse, shampoo and towel dry.
08.23 Prepare and apply toner.
08.24 Process, rinse, and shampoo.
08.25 Condition, if needed.
08.26 Style; record results.

09.0 IDENTIFY AND PERFORM MANICURE AND PEDICURE--The student will be able to:

09.01 Prepare the patron.
09.02 Assemble supplies and equipment.
09.03 Sanitize feet for pedicuring.
09.04 Remove polish, if any, and shape nails.
09.05 Soak in cuticle-cleansing and softening solution.
09.06 Apply cuticle solution.
09.07 Push and nip cuticles, if needed (do not use metal implements on feet).
09.08 Dip in cuticle-cleansing and softening solution; scrub.
09.09 Nip cuticles, if necessary (do not use metal implements on feet).
09.10 Apply cream or lotion: Perform arm and hand massage.
09.11 Clean nails (Separate toes with plastic footlets).
09.12 Apply nail tips or synthetic nails.
09.13 Apply base, polish; Apply top coat or buff.

10.0 IDENTIFY AND PERFORM FACIALS, MASSAGE, AND MAKE-UP--The student will be able to:

Facial Treatments

10.01 Prepare the patron.
10.02 Diagnose and identify skin condition.
10.03 Assemble supplies and equipment.
10.04 Cleanse face and neck.
10.05 Perform designated treatment (mechanical or manual).

10.06 Perform final cleansing of face and neck.
10.07 Perform eyebrow and lash treatment (tint/apply synthetic eyelashes).
10.08 Perform eyebrow tweezing and waxing.
10.09 Remove superfluous hair (using chemicals or wax).

Facial Make-up

10.10 Assemble supplies and equipment.
10.11 Apply base.
10.12 Apply eye make-up.
10.13 Apply rouge and lipstick.
10.14 Apply loose powder.

11.0 DEMONSTRATE BEAUTY SALON MANAGEMENT--The student will be able to:

11.01 Assist employees in setting personal goals.
11.02 Set shop goals and organize salon.
11.03 Develop operating budget.
11.04 Select workable site/location for salon.
11.05 Design physical layout and equipment list for salon (within budget limitations).
11.06 Prepare and implement marketing and advertising plan.
11.07 Prepare and implement sales plan.
11.08 Develop and maintain an appropriate accounting system.
11.09 Comply with state and local laws, rules, and regulations.
11.10 Develop an adequate insurance coverage plan.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.

13.0 DEMONSTRATE KNOWLEDGE OF STATE BOARD REQUIREMENTS--The student will be able to:

13.01 Complete Florida's State Board license examination.
13.02 Display Florida's Cosmetology License.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship.
14.02 Describe the importance of entrepreneurship to the American economy.
14.03 List the advantages and disadvantages of business ownership.
14.04 Identify the risks involved in ownership of a business.
14.05 Identify the necessary personal characteristics of a successful entrepreneur.
14.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Cosmetology
PROGRAM NUMBER: 8757000

COURSE TITLE: Cosmetology 1
COURSE NUMBER: 8757010

COURSE DESCRIPTION:

This course is designed to provide instruction in safety rules and procedures, school, classroom/laboratory procedures. It provides competencies in hair shampooing and scalp treatments.

01.0 EMPLOY PROPER LABORATORY PRACTICES--The student will be able to:

01.01 Observe and apply sanitation and shop safety rules and practices to all skill procedures.
01.02 Set up and operate equipment and materials.
01.03 Clean and maintain personal tools and equipment.
01.04 Demonstrate professional ethics with customers and co-workers.

02.0 PERFORM HAIR SHAMPOOING--The student will be able to:

02.01 Prepare the patron.
02.02 Diagnose and recognize hair and scalp condition.
02.03 Select appropriate shampoo products.
02.04 Apply shampoo and manipulate to cleanse hair and scalp.
02.05 Rinse shampoo from hair and scalp.
02.06 Select appropriate conditioner.
02.07 Apply conditioners and rinse (if necessary).
02.08 Towel-blot the hair.

03.0 IDENTIFY AND PERFORM SCALP TREATMENT--The student will be able to:

03.01 Prepare the patron.
03.02 Diagnose and Recognize hair and scalp condition.
03.03 Select appropriate treatment.
03.04 Apply treatment according to manufacturer specifications.
03.05 Perform scalp manipulative techniques.
03.06 Remove treatment.
03.07 Set up and operate electrical treatment equipment.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Cosmetology
PROGRAM NUMBER: 8757000

COURSE TITLE: Cosmetology 2
COURSE NUMBER: 8757020

COURSE DESCRIPTION:

This course is designed to provide competencies in hairshaping and instruction in the selection of proper hair cutting implements and proper style selection

04.0 IDENTIFY AND PERFORM HAIR SHAPING--The student will be able to:

04.01 Prepare the patron.
04.02 Determine customer desires and needs (basic/style).
04.03 Select proper hair-cutting implements (scissors, razors, thinning shears).
04.04 Section hair and cut guidelines.
04.05 Proceed with desired hair cut.
04.06 Check completed hair cut.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Cosmetology

PROGRAM NUMBER: 8757000

COURSE TITLE: Cosmetology 3

COURSE NUMBER: 8757030

COURSE DESCRIPTION:

This course is designed to provide competencies in hairstyling, preparation and principles of design and fitting of wigs and hair pieces.

05.0 IDENTIFY AND PERFORM HAIR STYLING--The student will be able to:

05.01 Prepare the patron and determine desired style.
05.02 Prepare and perform wet set using principles of design (finger waves, pin curls, or rollers).
05.03 Prepare and perform heat styling using either blow dryers, curling irons, straightening combs, pressing irons, or electric rollers.
05.04 Comb into style.

06.0 IDENTIFY AND PREPARE WIGS AND HAIR PIECES--The student will be able to:

06.01 Determine and identify styles and colors of wigs and hair pieces.
06.02 Measure the head and fit wig or hair piece.
06.03 Clean, shape, and style to patron's features.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Cosmetology

PROGRAM NUMBER: 8757000

COURSE TITLE: Cosmetology 4

COURSE NUMBER: 8757040

COURSE DESCRIPTION:

This course is designed to provide competencies in permanent waving and chemical hair restructuring (relaxing). Instruction in analyzing the hair, selection of approximate solutions, and implements is also provided.

07.0 IDENTIFY AND PERFORM PERMANENT WAVING/CHEMICAL HAIR RESTRUCTURING (RELAXING)--The student will be able to:

Permanent Waving

07.01 Prepare the patron and analyze hair.
07.02 Determine customer desires and needs.
07.03 Select appropriate perm solutions and rod size and follow manufacturer instructions.
07.04 Perform pre-permanent shampoo and shaping.
07.05 Section and wrap hair properly.
07.06 Apply protective cream or lotion; apply cotton to hairline.
07.07 Apply perm solution and process; take test curls.
07.08 Rinse, blot, and neutralize; rinse again.
07.09 Remove rods, condition, and style; record results.

Chemical Hair Restructuring (Relaxing)

07.10 Prepare the patron.
07.11 Analyze hair and scalp.
07.12 Section and apply chemical according to manufacturing directions.
07.13 Test for desired results.
07.14 Rinse, shampoo and style.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Cosmetology
PROGRAM NUMBER: 8757000
COURSE TITLE: Cosmetology 5
COURSE NUMBER: 8757050

COURSE DESCRIPTION:

This course is designed to provide the student with an opportunity to develop competencies in hair tinting and bleaching. This instruction includes analysis of hair and scalp, performance of predisposition test, selection of correct supplies and equipment.

08.0 IDENTIFY AND PERFORM HAIR COLOR RINSE, SEMI-PERMANENT COLOR, TINTING AND BLEACHING--The student will be able to:

08.01 Prepare the patron.
08.02 Analyze scalp and hair.
08.03 Determine customer desires and needs.
08.04 Perform and analyze patch test.
08.05 Perform strand test.
08.06 Assemble supplies and equipment.
08.07 Section hair.
08.08 Apply tint or bleach.

Color rinse or Semi-Permanent Color

08.09 Prepare colorrinse or semi-permanent color.
08.10 Shampoo patron.
08.11 Apply process according to manufacturer's directions.
08.12 Process.
08.13 Condition if needed.
08.14 Style; record results.

Permanent Coloring/Tinting

08.15 Prepare tint.
08.16 Apply selected tint for retouch or virgin hair.
08.17 Process, rinse, and shampoo.
08.18 Condition, if needed.
08.19 Style; record results.

Bleaching and Toning

08.20 Prepare bleach.
08.21 Apply bleach for retouch or virgin hair.
08.22 Process, rinse, shampoo and towel dry.
08.23 Prepare and apply toner.
08.24 Process, rinse, and shampoo.
08.25 Condition, if needed.
08.26 Style; record results.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Cosmetology
PROGRAM NUMBER: 8757000
COURSE TITLE: Cosmetology 6
COURSE NUMBER: 8757060

COURSE DESCRIPTION:

This course is designed to provide the student with an opportunity to develop competencies in manicuring, pedicuring, facials and make up. This instruction includes selection of supplies and equipment, sanitation procedures and performing designated procedures.

09.0 IDENTIFY AND PERFORM MANICURE AND PEDICURE--The student will be able to:

09.01 Prepare the patron.
09.02 Assemble supplies and equipment.
09.03 Sanitize feet for pedicuring.
09.04 Remove polish, if any, and shape nails.

Cosmetology 6 - Continued

09.05 Soak in cuticle-cleansing and softening solution.
09.06 Apply cuticle solution.
09.07 Push and nip cuticles, if needed (do not use metal implements on feet).
09.08 Dip in cuticle-cleansing and softening solution; scrub.
09.09 Nip cuticles, if necessary (do not use metal implements on feet).
09.10 Apply cream or lotion: Perform arm and hand massage.
09.11 Clean nails (Separate toes with plastic footlets).
09.12 Apply nail tips or synthetic nails.
09.13 Apply base, polish; Apply top coat or buff.

10.0 IDENTIFY AND PERFORM FACIALS, MASSAGE, AND MAKE-UP--The student will be able to:

Facial Treatments

10.01 Prepare the patron.
10.02 Diagnose and identify skin condition.
10.03 Assemble supplies and equipment.
10.04 Cleanse face and neck.
10.05 Perform designated treatment (mechanical or manual).
10.06 Perform final cleansing of face and neck.
10.07 Perform eyebrow and lash treatment (tint/apply synthetic eyelashes).
10.08 Perform eyebrow tweezing and waxing.
10.09 Remove superfluous hair (using chemicals or wax).

Facial Make-up

10.10 Assemble supplies and equipment.
10.11 Apply base.
10.12 Apply eye make-up.
10.13 Apply rouge and lipstick.
10.14 Apply loose powder.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Cosmetology
PROGRAM NUMBER: 8757000

COURSE TITLE: Cosmetology 7
COURSE NUMBER: 8757070

COURSE DESCRIPTION:

This course is designed to provide the student with an opportunity to develop competencies in salon management and employability skills. This instruction includes budgeting, site selection of building, design layout, selection of budgeting equipment, sales development, and employability skills required to succeed in industry.

11.0 DEMONSTRATE BEAUTY SALON MANAGEMENT--The student will be able to:

11.01 Assist employees in setting personal goals.
11.02 Set shop goals and organize salon.
11.03 Develop operating budget.
11.04 Select workable site/location for salon.
11.05 Design physical layout and equipment list for salon (within budget limitations).
11.06 Prepare and implement marketing and advertising plan.
11.07 Prepare and implement sales plan.
11.08 Develop and maintain an appropriate accounting system.
11.09 Comply with state and local laws, rules, and regulations.
11.10 Develop an adequate insurance coverage plan.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.

12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Cosmetology — PROGRAM NUMBER: 8757000

COURSE TITLE: Cosmetology 8 — COURSE NUMBER: 8757080

COURSE DESCRIPTION:

This course is designed to provide the student with competencies in State Board of Cosmetology requirements. This instruction includes the study of the cosmetology law and rules and regulations. The student will be knowledgeable of the requirements of the State Board examination.

13.0 DEMONSTRATE KNOWLEDGE OF STATE BOARD REQUIREMENTS--The student will be able to:

13.01 Complete Florida's State Board license examination.
13.02 Display Florida's Cosmetology License.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship.
14.02 Describe the importance of entrepreneurship to the American economy.
14.03 List the advantages and disadvantages of business ownership.
14.04 Identify the risks involved in ownership of a business.
14.05 Identify the necessary personal characteristics of a successful entrepreneur.
14.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Diesel Engine Mechanics

CODE NUMBER: Secondary 8742000 Postsecondary ______

Florida CIP IN47.060500

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVELS(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 10-12, 21

CERTIFICATION COVERAGE: DESEL MECH 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as diesel mechanics (625.281-010) or diesel engine mechanic helpers (625.684-010).

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and maintaining, troubleshooting, and repairing diesel engines used in industry. Graduates of this program will be prepared to enter advanced postsecondary training in heavy duty truck and bus mechanics and heavy equipment mechanics.

Listed below are the courses that comprise this program when offered at the secondary level:

8742010	Diesel Engine Mechanics 1
8742020	Diesel Engine Mechanics 2
8742030	Diesel Engine Mechanics 3
8742040	Diesel Engine Mechanics 4
8742050	Diesel Engine Mechanics 5
8742060	Diesel Engine Mechanics 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the tools, diagnostic equipment, and test equipment. The materials and processes used in the laboratory are similar to those used in industry. Graduates will be able to use the various tools and precision equipment found in general use throughout the diesel mechanics industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills, and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After sucessfully completing this program, the individual will be able to:

01. Demonstrate proficiency in performing diesel trade skills.
02. Demonstrate proficiency in applying electrical principles.
03. Demonstrate proficiency in applying electronic principles.
04. Demonstrate proficiency in maintaining and repairing diesel engines.
05. Demonstrate proficiency in maintaining and repairing electrical systems.
06. Demonstrate proficiency in reconditioning diesel fuel injection systems.
07. Demonstrate proficiency in reconditioning diesel engine components.
08. Demonstrate proficiency in overhauling diesel engines (2-stroke and 4-stroke cycle engines such as Caterpillar, Cummins, Detroit, Mack, etc.).
09. Demonstrate proficiency in performing diesel engine preventive maintenance (PM).
10. Demonstrate employability skills.
11. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial SECONDARY NUMBER: 8742000

PROGRAM TITLE: Diesel Engine Mechanics POSTSECONDARY NUMBER: ______

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING DIESEL TRADE SKILLS--The student will be able to:

01.01 Follow safety practices
01.02 Apply basic math skills
01.03 Apply intermediate math skills
01.04 Recognize, identify, and make metric conversions
01.05 Perform basic welding skills
01.06 Use hand tools
01.07 Use power tools
01.08 Use measuring and precision tools
01.09 Identify types of bearings and seals
01.10 Identify power train components and functions
01.11 Identify threaded fasteners by size, type, thread series, thread classes, material hardness, and compatibility
01.12 Read and use parts manuals
01.13 Read, interpret, and apply service manuals

02.0 DEMONSTRATE PROFICIENCY IN APPLYING ELECTRICAL PRINCIPLES--The student will be able to:

02.01 Identify the nature of electricity
02.02 Analyze electrical circuits
02.03 Define Ohm's and Kirchhoff's laws
02.04 Identify magnetism and electromagnetic induction
02.05 Identify applications of alternating current
02.06 Identify principles of DC motors and generators
02.07 Identify principles of AC motors
02.08 Locate and match electrical units by their symbols on a wiring diagram
02.09 Set up and use voltmeters, ammeters, and ohmmeters

03.0 DEMONSTRATE PROFICIENCY IN APPLYING ELECTRONIC PRINCIPLES--The student will be able to:

03.01 Identify principles of diodes and rectifiers
03.02 Identify principles of voltage regulation and power supply circuits
03.03 Identify principles of transistors
03.04 Identify principles of the silicon controlled rectifier (SCR)
03.05 Identify components of electronic systems and their functions

04.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING DIESEL ENGINES --The student will be able to:

04.01 Identify diesel engine operating principles (2- and 4-stroke cycle engines)
04.02 Identify components of 2- and 4-stroke cycle engines
04.03 Troubleshoot and repair cooling systems
04.04 Troubleshoot and repair lubrication systems
04.05 Troubleshoot and repair induction and exhaust systems

05.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING ELECTRICAL SYSTEMS--The student will be able to:

05.01 Test and service batteries
05.02 Test and repair starting systems
05.03 Test and repair DC charging systems
05.04 Test and repair AC charging systems
05.05 Test and repair ignition systems
05.06 Test and repair lighting and accessories systems
05.07 Test and service instruments and gauges

06.0 DEMONSTRATE PROFICIENCY IN RECONDITIONING DIESEL FUEL INJECTION SYSTEMS --The student will be able to:

06.01 Identify fuel injection systems principles and components
06.02 Troubleshoot fuel injection systems and components
06.03 Remove, replace, and adjust fuel injection systems and components

06.04 Identify governor types and operating principles
06.05 Troubleshoot governors
06.06 Remove, repair or replace, and adjust governors

07.0 DEMONSTRATE PROFICIENCY IN RECONDITIONING DIESEL ENGINE COMPONENTS--The student will be able to:

07.01 Explain the basic principles of the operation of the 4-stroke cycle diesel engine
07.02 Identify engine assemblies and systems
07.03 Diagnose valve and head problems by use of the visual inspection method
07.04 Diagnose valve and head problems by use of the compression tester method or cylinder air pressure method
07.05 Diagnose valve and head problems by use of the stethoscope method
07.06 Disassemble engines
07.07 Clean and inspect heads for cracks, warpage, and injector sleeves
07.08 Inspect valves for warpage, burns, cracks, stem wear, tip wear, and valve seat
07.09 Grind valve seats and reface valves
07.10 Check and inspect springs for free height, distortion, and installed height
07.11 Adjust valve lash
07.12 Remove and inspect camshaft bearings and lifters
07.13 Time valve drive assemblies
07.14 Remove pistons from rod assemblies
07.15 Measure out-of-round and cylinder taper with a dial bore gauge or micrometer
07.16 Check piston pins and boss for wear
07.17 Measure piston ring lands width, out-of-round, and taper
07.18 Measure the piston ring gap in a cylinder bore
07.19 Install and fit piston pins
07.20 Check rod and piston assembly alignment
07.21 Remove and replace rod bearings
07.22 Hone and clean cylinders
07.23 Install rings on pistons
07.24 Measure and check crankshafts with a micrometer
07.25 Check the bearing bore with a telescoping gauge
07.26 Reassemble engines using a plastic gauge
07.27 Install oil seals
07.28 Check for end play

08.0 DEMONSTRATE PROFICIENCY IN OVERHAULING DIESEL ENGINES (2-STROKE AND 4-STROKE CYCLE ENGINES SUCH AS CATERPILLAR, CUMMINS, DETROIT, MACK, ETC.)--The student will be able to:

08.01 Troubleshoot and diagnose engine problems
08.02 Remove and install electrical equipment
08.03 Recondition turbochargers, blowers, and superchargers
08.04 Recondition cooling systems
08.05 Recondition intake and exhaust manifolds
08.06 Recondition fans, vibrator dampers, and front pulleys
08.07 Recondition air compressors
08.08 Recondition flywheels
08.09 Recondition flywheel housings
08.10 Recondition lubrication systems
08.11 Recondition front covers
08.12 Remove and install fuel systems
08.13 Recondition cylinder heads
08.14 Recondition cylinder sleeves and pistons
08.15 Recondition camshafts and accessory drives
08.16 Recondition crankshafts
08.17 Recondition cylinder blocks
08.18 Perform dynamometer tests

09.0 DEMONSTRATE PROFICIENCY IN PERFORMING DIESEL ENGINE PREVENTIVE MAINTENANCE (PM)--The student will be able to:

09.01 Perform PM inspection "A"
09.02 Perform PM inspection "B"
09.03 Perform PM inspection "C"

10.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

10.01 Conduct a job search
10.02 Secure information about a job
10.03 Identify documents that may be required when applying for a job
10.04 Complete a job application form correctly
10.05 Demonstrate competence in job interview techniques
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
10.07 Identify acceptable work habits
10.08 Demonstrate knowledge of how to make job changes appropriately
10.09 Demonstrate acceptable employee health habits

11.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

11.01 Define entrepreneurship
11.02 Describe the importance of entrepreneurship to the American economy
11.03 List the advantages and disadvantages of business ownership
11.04 Identify the risks involved in ownership of a business
11.05 Identify the necessary personal characteristics of a successful entrepreneur
11.06 Identify the business skills needed to operate a small business efficiently and effectively

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Diesel Engine Mechanics
PROGRAM NUMBER: 8742000
COURSE TITLE: Diesel Engine Mechanics 1
COURSE NUMBER: 8742010

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing diesel trade skills, and proficiency in employability skills.

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING DIESEL TRADE SKILLS--The student will be able to:

01.01 Follow safety practices
01.02 Apply basic math skills
01.03 Apply intermediate math skills
01.04 Recognize, identify, and make metric conversions
01.05 Perform basic welding skills
01.06 Use hand tools
01.07 Use power tools
01.08 Use measuring and precision tools
01.09 Identify types of bearings and seals
01.10 Identify power train components and functions
01.11 Identify threaded fasteners by size, type, thread series, thread classes, material hardness, and compatibility
01.12 Read and use parts manuals
01.13 Read, interpret, and apply service manuals

10.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

10.01 Conduct a job search
10.02 Secure information about a job
10.03 Identify documents that may be required when applying for a job
10.04 Complete a job application form correctly
10.05 Demonstrate competence in job interview techniques
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
10.07 Identify acceptable work habits
10.08 Demonstrate knowledge of how to make job changes appropriately
10.09 Demonstrate acceptable employee health habits

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Diesel Engine Mechanics
PROGRAM NUMBER: 8742000
COURSE TITLE: Diesel Engine Mechanics 2
COURSE NUMBER: 8742020

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for applying electrical and electronic principles.

02.0 DEMONSTRATE PROFICIENCY IN APPLYING ELECTRICAL PRINCIPLES--The student will be able to:

02.01 Identify the nature of electricity
02.02 Analyze electrical circuits
02.03 Define Ohm's and Kirchhoff's laws
02.04 Identify magnetism and electromagnetic induction
02.05 Identify applications of alternating current
02.06 Identify principles of DC motors and generators
02.07 Identify principles of AC motors
02.08 Locate and match electrical units by their symbols on a wiring diagram
02.09 Set up and use voltmeters, ammeters, and ohmmeters

Diesel Engine Mechanics 2 - Continued

03.0 DEMONSTRATE PROFICIENCY IN APPLYING ELECTRONIC PRINCIPLES--The student will be able to:

03.01 Identify principles of diodes and rectifiers
03.02 Identify principles of voltage regulation and power supply circuits
03.03 Identify principles of transistors
03.04 Identify principles of the silicon controlled rectifier (SCR)
03.05 Identify components of electronic systems and their functions

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STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial — COURSE CREDIT: 1
PROGRAM TITLE: Diesel Engine Mechanics — PROGRAM NUMBER: 8742000
COURSE TITLE: Diesel Engine Mechanics 3 — COURSE NUMBER: 8742030

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for the maintenance and repair of diesel engines, and electrical systems.

04.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING DIESEL ENGINES --The student will be able to:

04.01 Identify diesel engine operating principles (2- and 4-stroke cycle engines)
04.02 Identify components of 2- and 4-stroke cycle engines
04.03 Troubleshoot and repair cooling systems
04.04 Troubleshoot and repair lubrication systems
04.05 Troubleshoot and repair induction and exhaust systems

05.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING ELECTRICAL SYSTEMS--The student will be able to:

05.01 Test and service batteries
05.02 Test and repair starting systems
05.03 Test and repair DC charging systems
05.04 Test and repair AC charging systems
05.05 Test and repair ignition systems
05.06 Test and repair lighting and accessories systems
05.07 Test and service instruments and gauges

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial — COURSE CREDIT: 1
PROGRAM TITLE: Diesel Engine Mechanics — PROGRAM NUMBER: 8742000
COURSE TITLE: Diesel Engine Mechanics 4 — COURSE NUMBER: 8742040

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for reconditioning diesel fuel injection systems.

06.0 DEMONSTRATE PROFICIENCY IN RECONDITIONING DIESEL FUEL INJECTION SYSTEMS --The student will be able to:

06.01 Identify fuel injection systems principles and components
06.02 Troubleshoot fuel injection systems and components
06.03 Remove, replace, and adjust fuel injection systems and components
06.04 Identify governor types and operating principles

Diesel Engine Mechanics 4 - Continued

06.05 Troubleshoot governors
06.06 Remove, repair or replace, and adjust governors

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Diesel Engine Mechanics — PROGRAM NUMBER: 8742000

COURSE TITLE: Diesel Engine Mechanics 5 — COURSE NUMBER: 8742050

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for reconditioning diesel engine components.

07.0 DEMONSTRATE PROFICIENCY IN RECONDITIONING DIESEL ENGINE COMPONENTS --The student will be able to:

07.01 Explain the basic principles of the operation of the 4-stroke cycle diesel engine
07.02 Identify engine assemblies and systems
07.03 Diagnose valve and head problems by use of the visual inspection method
07.04 Diagnose valve and head problems by use of the compression tester method or cylinder air pressure method
07.05 Diagnose valve and head problems by use of the stethoscope method
07.06 Disassemble engines
07.07 Clean and inspect heads for cracks, warpage, and injector sleeves
07.08 Inspect valves for warpage, burns, cracks, stem wear, tip wear, and valve seat
07.09 Grind valve seats and reface valves
07.10 Check and inspect springs for free height, distortion, and installed height
07.11 Adjust valve lash
07.12 Remove and inspect camshaft bearings and lifters
07.13 Time valve drive assemblies
07.14 Remove pistons from rod assemblies
07.15 Measure out-of-round and cylinder taper with a dial bore gauge or micrometer
07.16 Check piston pins and boss for wear
07.17 Measure piston ring lands width, out-of-round, and taper
07.18 Measure the piston ring gap in a cylinder bore
07.19 Install and fit piston pins
07.20 Check rod and piston assembly alignment
07.21 Remove and replace rod bearings
07.22 Hone and clean cylinders
07.23 Install rings on pistons
07.24 Measure and check crankshafts with a micrometer
07.25 Check the bearing bore with a telescoping gauge
07.26 Reassemble engines using a plastic gauge
07.27 Install oil seals
07.28 Check for end play

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Diesel Engine Mechanics — PROGRAM NUMBER: 8742000

COURSE TITLE: Diesel Engine Mechanics 6 — COURSE NUMBER: 8742060

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for overhauling diesel engines and performing diesel engine preventive maintenance.

08.0 DEMONSTRATE PROFICIENCY IN OVERHAULING DIESEL ENGINES (2-STROKE AND 4-STROKE CYCLE ENGINES SUCH AS CATERPILLAR, CUMMINS, DETROIT, MACK, ETC.)--The student will be able to:

08.01 Troubleshoot and diagnose engine problems
08.02 Remove and install electrical equipment
08.03 Recondition turbochargers, blowers, and superchargers
08.04 Recondition cooling systems
08.05 Recondition intake and exhaust manifolds
08.06 Recondition fans, vibrator dampers, and front pulleys
08.07 Recondition air compressors
08.08 Recondition flywheels
08.09 Recondition flywheel housings
08.10 Recondition lubrication systems
08.11 Recondition front covers
08.12 Remove and install fuel systems
08.13 Recondition cylinder heads
08.14 Recondition cylinder sleeves and pistons
08.15 Recondition camshafts and accessory drives
08.16 Recondition crankshafts
08.17 Recondition cylinder blocks
08.18 Perform dynamometer tests

09.0 DEMONSTRATE PROFICIENCY IN PERFORMING DIESEL ENGINE PREVENTIVE MAINTENANCE (PM)--The student will be able to:

09.01 Perform PM inspection "A"
09.02 Perform PM inspection "B"
09.03 Perform PM inspection "C"

11.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

11.01 Define entrepreneurship
11.02 Describe the importance of entrepreneurship to the American economy
11.03 List the advantages and disadvantages of business ownership
11.04 Identify the risks involved in ownership of a business
11.05 Identify the necessary personal characteristics of a successful entrepreneur
11.06 Identify the business skills needed to operate a small business efficiently and effectively

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Drafting and Design Technology

CODE NUMBER: Secondary ______ Postsecondary ETD0070

Florida CIP IN15.020200

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-15

CERTIFICATION COVERAGE: TEC DRAFT @ 7 TEC CONSTR @ 7
DRAFTING 7 BLDG CONST @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as drafters (10080600), assistant drafters (017.281-018), detailers (071.281-018), detailers (017.261-018), electromechanical drafters (017.261-018), mechanical drafters (007.281-014), pipe detailers (017.261-038), CAD operators, or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, drafting standards, math skills and drafting office practices to assist mathematical, electrical and electronic, architectural, chemical, civil, or other engineers in the design and drafting of electrical circuits, machines, structures, weldments or architectural plans. Includes instruction in the preparation of engineering plans, layouts and detailed drawings according to conventional projection principles, preparation of charts, graphs or diagrams, and the use of handbook data germane to design and drafting in various fields..

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in drafting with the tools, materials, technical data, calculators and blueprint machines used in the laboratory similar to those used in industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 10.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply basic drafting skills.
02. Prepare mechanical drawings.
03. Prepare electrical/electronic drawings.

Drafting and Design Technology - Continued

04. Prepare pneumatic/hydraulic drawings.
05. Prepare charts and graphs.
06. Apply technical mathematics.
07. Prepare architectural drawings.
08. Prepare computer aided drawings.
09. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS

DRAFTING AND DESIGN TECHNOLOGY

01.0 APPLYING BASIC DRAFTING SKILLS — The student will be able to:

01.01 Apply safety practices.
01.02 Operate drafting instrument.
01.03 Perform lettering techniques.
01.04 Prepare multi-view drawings.
01.05 Prepare sectional views.
01.06 Prepare auxiliary views.
01.07 Prepare dimension drawings.
01.08 Prepare pictorial drawings.
01.09 Prepare sketches.
01.10 Prepare title blocks and other formats.
01.11 Apply systems drafting techniques.
01.12 Compile a portfolio.

02.0 PREPARE MECHANICAL DRAWINGS — The student will be able to:

02.01 Prepare fastener drawings.
02.02 Prepare cam drawings.
02.03 Prepare gear drawings.
02.04 Prepare assembly drawings.
02.05 Prepare detail drawings.
02.06 Prepare surface developments.
02.07 Prepare technical drawings.
02.08 Prepare welding drawings.
02.09 Prepare bearing drawings.
02.10 Prepare spring drawings.
02.11 Prepare casting drawings.
02.12 Prepare forging drawings.
02.13 Prepare tool drawings.
02.14 Prepare molding diagrams.
02.15 Prepare drawings with special processed holes.
02.16 Prepare stamping drawings.
02.17 Prepare numerical control drawings.
02.18 Prepare computer aided drawings.

03.0 PREPARE ELECTRICAL/ELECTRONIC DRAWINGS — The student will be able to:

03.01 Prepare schematic drawings.
03.02 Prepare printed circuit board drawings.
03.03 Prepare package drawings.
03.04 Prepare connection drawings.
03.05 Prepare interconnection drawings.
03.06 Prepare wiring lists.
03.07 Prepare cable drawings.
03.08 Prepare harness drawings.
03.09 Prepare component drawings.
03.10 Prepare logic diagrams.

04.0 PREPARE PNEUMATIC/HYDRAULIC DRAWINGS — The student will be able to:

04.01 Prepare piping drawings.
04.02 Prepare pump and motor drawings.
04.03 Prepare cylinder and piston diagrams.
04.04 Prepare valve drawings.
04.05 Prepare pump section drawings.
04.06 Prepare pulley and chain drive drawings.

05.0 PREPARE CHARTS AND GRAPHS — The student will be able to:

05.01 Prepare charts.
05.02 Prepare graphs.

06.0 APPLYING TECHNICAL MATHEMATICS — The student will be able to:

06.01 Solve arithmetic problems.
06.02 Solve algebra problems.
06.03 Solve trigonometry problems.
06.04 Solve geometry problems.

06.05 Solve surveying problems.

07.0 PREPARE ARCHITECTURAL DRAWINGS — The student will be able to:

07.01 Prepare floor plan drawings.
07.02 Prepare foundation plan and detail drawings.
07.03 Prepare elevation drawings.
07.04 Prepare landscape layouts.
07.05 Prepare schedules.
07.06 Prepare sections.
07.07 Build architectural models.
07.08 Prepare truss drawings.
07.09 Prepare stairway drawings.
07.10 Prepare fireplace drawings.
07.11 Prepare plot plan drawings.
07.12 Prepare plumbing plan drawings.
07.13 Prepare climate control drawings.
07.14 Prepare electrical plan drawings.

08.0 PREPARE COMPUTER AIDED DRAWINGS — The student will be able to:

08.01 Operate work terminal.
08.02 Utilize system commands.
08.03 Perform drafting procedures.
08.04 Operate peripheral equipment.
08.05 Apply specialized CAD functions.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS — The student will be able to:

09.01 List sources of job openings other than public or private employment agencies.
09.02 Write a letter of application for a job.
09.03 Prepare a vita, resume, or personal fact sheet.
09.04 List factors to consider when applying for a job.
09.05 List ways of making contact with employers.
09.06 Identify documents which may be required when applying for a job interview.
09.07 Complete a job application form correctly.
09.08 Identify appropriate dress and grooming for a job interview.
09.09 Classify behaviors considered appropriate or inappropriate in a job interview situation.
09.10 Describe advantages to employer and employees of being a productive worker.
09.11 Explain the purpose of supervision, self discipline, and performance evaluation.
09.12 Identify appropriate response(s) to criticism from employer, supervisor, or other employees.
09.13 List consequences of being absent frequently from the job.
09.14 List consequences of frequently arriving late for work.
09.15 List factors to consider when resigning from a job.
09.16 Write a letter of resignation.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Dry Cleaning and Laundering

CODE NUMBER: Secondary 8733000 Postsecondary HEV0800

Florida CIP IN12.010100

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVEL(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational ____ Other 10-12, 13-15, 21

CERTIFICATION COVERAGE: DRY CLEAN @ 7 FAB MAINT 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as spotters (362.381-010), drycleaners (362.382-014), leather cleaners (362.684-026), all-around pressers (363.682-014), hand pressers (363.684-018).

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and skills needed to operate and manage dry cleaning plants including receiving, cleaning, reparing and returning garments to customers.

Listed below are the courses that comprise this program when offered at the secondary level:

8733010	Dry Cleaning and Laundering 1
8733020	Dry Cleaning and Laundering 2
8733030	Dry Cleaning and Laundering 3
8733040	Dry Cleaning and Laundering 4
8733050	Dry Cleaning and Laundering 5
8733060	Dry Cleaning and Laundering 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in hands-on experiences with chemicals, implements and equipment appropriate to the program content and in accordance with current practices in the trade. Strong emphasis is placed on stain identification, stain removal, chemical safety and cleaning and finishing garments.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 900 hours. Students may concentrate in the areas of pressing/finishing by completing only outcomes 1-16 and 30 below on as a spotter clearer by completing only outcomes 1-17 through 30 below.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate understanding of procedures of orientation and safety.
02. Use and maintain spotting equipment and tools.
03. Identify fibers and fabrics.
04. Identify and test fabrics drystuffs.
05. Demonstrate understanding of chemicals and formulas.
06. Identify stains.
07. Remove stains.
08. Explain properties and uses of petroleum and synthetic solvents.
09. Operate synthetic washer-extractors.
10. Operate reclaiming tumblers.
11. Operate filters.
12. Demonstrate understanding of safety precautions.
13. Demonstrate troubleshooting skills.
14. Demonstrate proper operation of stills.
15. Operate pumps at maximum efficiency.
16. Clean garments.
17. Adjust and operate utility pressers.
18. Adjust and operate mushroom and automatic pants topper.
19. Adjust and operate automatic leggers.
20. Operate form finishers.
21. Finish slacks and shirts.
22. Finish coats.
23. Finish trousers.
24. Finish dresses.
25. Finish children's garments.
26. Finish pleats and knitted garments.
27. Finish silk.
28. Inspect garments.
29. Perform routine maintenance.
30. Demonstrate employability skills.
31. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial SECONDARY NUMBER: 8733000

PROGRAM TITLE: Drycleaning and Laundering POSTSECONDARY NUMBER: HEV0800

01.0 DEMONSTRATE UNDERSTANDING OF PROCEDURES OF ORIENTATION AND SAFETY--The student will be able to:

01.01 Define objectives of the course.
01.02 Explain safety procedures.
01.03 Explain school/class procedures.

02.0 USE AND MAINTAIN SPOTTING EQUIPMENT AND TOOLS--The student will be able to:

02.01 Identify the spotter's equipment and tools.
02.02 Demonstrate the ability to use the spotter's equipment and tools.
02.03 Write a list of equipment and tools.

03.0 IDENTIFY FIBERS AND FABRICS--The student will be able to:

03.01 Identify fibers and fabrics.
03.02 Explain methods of how fabrics are constructed.
03.03 Define the characteristics of fibers.
03.04 Demonstrate the burning tests for fiber content.

04.0 IDENTIFY AND TEST FABRICS AND DYESTUFFS--The student will be able to:

04.01 Identify fabrics and dyestuffs.
04.02 Define the composition of dyestuffs.
04.03 Determine proper cleaning procedure for fabrics and dyes.

05.0 DEMONSTRATE UNDERSTANDING OF CHEMICALS AND FORMULAS--The student will be able to:

05.01 Define the chemical properties of the formula and their effect on the fabric.
05.02 Write a list of formulas used in spotting.
05.03 Write a list of spotting agents.

06.0 IDENTIFY STAINS--The student will be able to:

06.01 Define the methods of stain identification.
06.02 Write the various methods of stain identification.

07.0 REMOVE STAINS--The student will be able to:

07.01 Identify a stain.
07.02 Write the methods of removing stains.
07.03 Demonstrate the methods of removing stains.

08.0 EXPLAIN PROPERTIES AND USES OF PETROLEUM AND SYNTHETIC SOLVENTS--The student will be able to:

08.01 Write a brief history of the development of petroleum solvent.
08.02 Write the methods of refining petroleum solvents.
08.03 Write specifications for petroleum solvent.
08.04 Write the properties of synthetic solvent.
08.05 Write the methods of making synthetic solvent.

09.0 OPERATE SYNTHETIC WASHER-EXTRACTORS--The student will be able to:

09.01 Demonstrate the ability to set the controls on the machine.
09.02 Demonstrate the ability to load the machine with solvent.
09.03 Exhibit the ability to operate the machine manually.

10.0 OPERATE RECLAIMING TUMBLERS--The student will be able to:

10.01 Exhibit the ability to operate the tumbler.
10.02 Demonstrate the ability to control the temperature on the tumbler.
10.03 Exhibit the ability to operate the drying cabinet.

11.0 OPERATE FILTERS--The student will be able to:

11.01 Exhibit the ability to operate the filter.
11.02 Explain the operation of the cooker and still.
11.03 Explain filter maintenance methods.

12.0 DEMONSTRATE UNDERSTANDING OF SAFETY PRECAUTIONS--The student will be able to:

12.01 Explain the control limitations.
12.02 Exhibit the ability to check the basket for burrs and pins.
12.03 Demonstrate the ability to adjust the loading doors.
12.04 Define faulty pump.

13.0 DEMONSTRATE TROUBLESHOOTING SKILLS--The student will be able to:

13.01 Explain the use of the filter pressure gauge.
13.02 Explain plugged screens, tubes or bags.
13.03 Exhibit the ability to steam clean and boil screens or tubes, cleaning bags.
13.04 Describe in writing the distilling solvent.
13.05 Exhibit the ability to operate the pump on the filter.

14.0 DEMONSTRATE PROPER OPERATION OF STILLS--The student will be able to:

14.01 Explain the causes of slow down in distilling the solvent.
14.02 List factors of worn out pump.
14.03 Explain vacuum leak.
14.04 Explain a steam or a water leak.
14.05 Define vacuum still pressure.
14.06 Explain how to clean dirty heating tubes.
14.07 Determine a faulty steam trap.
14.08 Diagnose an odor in a distilled solvent.

15.0 OPERATE PUMPS AT MAXIMUM EFFICIENCY--The student will be able to:

15.01 Demonstrate the reducing or no flow of solvent.
15.02 Define the loss of pump prime.
15.03 Demonstrate the valves in either the suction or discharge line completely or partially closed.
15.04 Demonstrate the clogged strainers in suction line.
15.05 Determine the solvent level in tanks below the pump lines.
15.06 Explain the pump drive belt slipping.
15.07 Explain the pressure relief valve that is open on gear pumps.
15.08 Define the lint build up on the impeller in the pump.

16.0 CLEAN GARMENTS--The student will be able to:

16.01 Demonstrate an understanding of what causes excessive redeposit.
16.02 Explain insufficient filter flow rate.
16.03 Define improper garment classification.
16.04 Explain dissolved garment classification.
16.05 Define excessive oils or greases in the solvent.
16.06 Write how wrinkles occur in drycleaning.
16.07 Diagnose the causes of garments' streaks, slow drying or spotting rings.
16.08 Determine the reason for objectionable odors.
16.09 Define bleeding of dyes.
16.10 Describe dye or soil pick-up in local areas.
16.11 Explain restoration procedures of insoluble soil.
16.12 Demonstrate the method of softening plastic-coated fabrics.

17.0 ADJUST AND OPERATE UTILITY PRESSERS--The student will be able to:

17.01 Write the specifications for the utility press.
17.02 Demonstrate the ability to operate the utility press.
17.03 Perform the maintenance procedure.
17.04 Explain the variable pressure operation.
17.05 Explain the iron attachment.

18.0 ADJUST AND OPERATE MUSHROOM AND AUTOMATIC PANTS TOPPER--The student will be able to:

18.01 State the specifications for the topper press.
18.02 Demonstrate the operation of the pants topper.
18.03 Explain the timer on the automatic topper press.
18.04 Demonstrate the programmer adjustment procedures on the topper.

19.0 ADJUST AND OPERATE AUTOMATIC LEGGERS--The student will be able to:

19.01 State the specifications for the automatic legger.
19.02 Demonstrate the operation of the legger.
19.03 Define the timer on the legger.
19.04 Demonstrate the mechanical adjustment of the legger.

20.0 OPERATE FORM FINISHERS--The student will be able to:

20.01 List the specifications for the form finisher.
20.02 Explain the steps for the timer on form finisher.
20.03 Demonstrate the operation of the form finisher.
20.04 Perform the steps for finishing a coat.
20.05 Perform the steps for finishing a dress.

21.0 FINISH SLACKS AND SKIRTS--The student will be able to:

21.01 Demonstrate the steps necessary to place back, left hip of slacks on mushroom press.
21.02 Describe the steps necessary to place back right hip of slacks on mushroom press.
21.03 Demonstrate the steps necessary to place front, right hip of slacks on pres.
21.04 List the necessary steps to place front, left hip of slacks on press.
21.05 State the methods of legging slacks on regular press.
21.06 Demonstrate the methods necessary when finishing skirts.

22.0 FINISH COATS--The student will be able to:

22.01 State procedures for finishing coats on the form finisher and utility press.
22.02 Demonstrate steps in finishing sleeves on coats.
22.03 State methods of finishing coat collars.
22.04 Explain steps in finishing the front left shoulder and sleeve head.
22.05 State steps in finishing front lay.
22.06 Explain methods of finishing lapels.
22.07 Demonstrate steps in finishing linings.

23.0 FINISH TROUSERS--The student will be able to:

23.01 State the procedures in topping trousers on upright presser.
23.02 Demonstrate steps in finishing trouser tops or waistbands.
23.03 List steps in finishing pockets on trousers.
23.04 Demonstrate the steps in finishing left legs of trousers.
23.05 Demonstrate steps in finishing right legs of trousers.

24.0 FINISH DRESSES--The student will be able to:

24.01 State the operations for finishing sleeves on dresses.
24.02 Demonstrate the steps in finishing collars and lapels on dresses.
24.03 State the process of finishing blouses.
24.04 Demonstrate the steps for finishing skirts of dresses.

25.0 FINISH CHILDREN'S GARMENTS--The student will be able to:

25.01 List the methods of finishing a sleeve on a child's coat.
25.02 Demonstrate steps in finishing collars and trim.
25.03 Explain the steps in finishing fronts and backs of coats.
25.04 Demonstrate methods of finishing trousers.
25.05 List the steps for finishing boys' and girls' jackets.

26.0 FINISH PLEATS AND KNITTED GARMENTS--The student will be able to:

26.01 Demonstrate steps for finishing pleats.
26.02 State the procedure for finishing pleats on the sleeve board.
26.03 State methods for finishing pleats on the utility press.
26.04 State methods for finishing knitted garments.
26.05 Define the methods of measuring knitted garments before and after finishing.
26.06 List methods of handling finished knitted garments.

27.0 FINISH SILK--The student will be able to:

27.01 Explain the methods of finishing sleeves on the sleeve puff iron.
27.02 Demonstrate methods of finishing a skirt on the long press.
27.03 Describe the steps in finishing collars and lapels.
27.04 Describe the steps in finishing collars and lapels.
27.05 Demonstrate the steps in touch-up of finished garments.

28.0 INSPECT GARMENTS--The student will be able to:

28.01 Demonstrate methods of inspection.
28.02 Define the points of inspection in the order in which the work has gone through the various departments.
28.03 State the processes of inspecting garments which need special attention.

29.0 ROUTINE MAINTENANCE--The student will be able to:

29.01 Determine causes of machine malfunction.
29.02 Perform preventative maintenance.
29.03 Perform shop housekeeping duties.
29.04 Explain and demonstrate proper handling and storage of flammable and/or toxic materials.

30.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

30.01 Conduct a job search.
30.02 Secure information about a job.
30.03 Identify documents which may be required when applying for a job interview.
30.04 Complete a job application form correctly.
30.05 Demonstrate competence in job interview techniques.
30.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
30.07 Identify acceptable work habits.
30.08 Demonstrate knowledge of how to make job changes appropriately.
30.09 Demonstrate acceptable employee health habits.

31.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

31.01 Define entrepreneurship.
31.02 Describe the importance of entrepreneurship to the American economy.
31.03 List the advantages and disadvantages of business ownership.
31.04 Identify the risks involved in ownership of a business.
31.05 Identify the necessary personal characteristics of a successful entrepreneur.
31.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Dry Cleaning and Laundering PROGRAM NUMBER: 8733000

COURSE TITLE: Dry Cleaning and Laundering 1 COURSE NUMBER: 8733010

COURSE DESCRIPTION:

This course will include orientation and safety, spotting, stain removal and employability skills.

01.0 DEMONSTRATE UNDERSTANDING OF PROCEDURES OF ORIENTATION AND SAFETY--The student will be able to:

01.01 Define objectives of the course.
01.02 Explain safety procedures.
01.03 Explain school/class procedures.

02.0 USE AND MAINTAIN SPOTTING EQUIPMENT AND TOOLS--The student will be able to:

02.01 Identify the spotter's equipment and tools.
02.02 Demonstrate the ability to use the spotter's equipment and tools.
02.03 Write a list of equipment and tools.

03.0 IDENTIFY FIBERS AND FABRICS--The student will be able to:

03.01 Identify fibers and fabrics.
03.02 Explain methods of how fabrics are constructed.
03.03 Define the characteristics of fibers.
03.04 Demonstrate the burning tests for fiber content.

04.0 IDENTIFY AND TEST FABRICS AND DYESTUFFS--The student will be able to:

04.01 Identify fabrics and dyestuffs.
04.02 Define the composition of dyestuffs.
04.03 Determine proper cleaning procedure for fabrics and dyes.

05.0 DEMONSTRATE UNDERSTANDING OF CHEMICALS AND FORMULAS--The student will be able to:

05.01 Define the chemical properties of the formula and their effect on the fabric.
05.02 Write a list of formulas used in spotting.
05.03 Write a list of spotting agents.

06.0 IDENTIFY STAINS--The student will be able to:

06.01 Define the methods of stain identification.
06.02 Write the various methods of stain identification.

07.0 REMOVE STAINS--The student will be able to:

07.01 Identify a stain.
07.02 Write the methods of removing stains.
07.03 Demonstrate the methods of removing stains.

08.0 EXPLAIN PROPERTIES AND USES OF PETROLEUM AND SYNTHETIC SOLVENTS--The student will be able to:

08.01 Write a brief history of the development of petroleum solvent.
08.02 Write the methods of refining petroleum solvents.
08.03 Write specifications for petroleum solvent.
08.04 Write the properties of synthetic solvent.
08.05 Write the methods of making synthetic solvent.

30.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

30.01 Conduct a job search.
30.02 Secure information about a job.
30.03 Identify documents which may be required when applying for a job interview.
30.04 Complete a job application form correctly.
30.05 Demonstrate competence in job interview techniques.
30.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
30.07 Identify acceptable work habits.
30.08 Demonstrate knowledge of how to make job changes appropriately.
30.09 Demonstrate acceptable employee health habits.

31.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

31.01 Define entrepreneurship.
31.02 Describe the importance of entrepreneurship to the American economy.
31.03 List the advantages and disadvantages of business ownership.
31.04 Identify the risks involved in ownership of a business.
31.05 Identify the necessary personal characteristics of a successful entrepreneur.
31.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Dry Cleaning and Laundering
PROGRAM NUMBER: 8733000
COURSE TITLE: Dry Cleaning and Laundering 2
COURSE NUMBER: 8733020

COURSE DESCRIPTION:

This course provides instruction and shop/lab experience in operation of dry cleaning and laundry machines.

09.0 OPERATE SYNTHETIC WASHER-EXTRACTORS--The student will be able to:

09.01 Demonstrate the ability to set the controls on the machine.
09.02 Demonstrate the ability to load the machine with solvent.
09.03 Exhibit the ability to operate the machine manually.

10.0 OPERATE RECLAIMING TUMBLERS--The student will be able to:

10.01 Exhibit the ability to operate the tumbler.
10.02 Demonstrate the ability to control the temperature on the tumbler.
10.03 Exhibit the ability to operate the drying cabinet.

11.0 OPERATE FILTERS--The student will be able to:

11.01 Exhibit the ability to operate the filter.
11.02 Explain the operation of the cooker and still.
11.03 Explain filter maintenance methods.

12.0 DEMONSTRATE UNDERSTANDING OF SAFETY PRECAUTIONS--The student will be able to:

12.01 Explain the control limitations.
12.02 Exhibit the ability to check the basket for burrs and pins.
12.03 Demonstrate the ability to adjust the loading doors.
12.04 Define faulty pump.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Dry Cleaning and Laundering PROGRAM NUMBER: 8733000

COURSE TITLE: Dry Cleaning and Laundering 3 COURSE NUMBER: 8733030

COURSE DESCRIPTION:

This course provides instruction in the use and operation of pumps and stills.

14.0 DEMONSTRATE PROPER OPERATION OF STILLS--The student will be able to:

14.01 Explain the causes of slow down in distilling the solvent.
14.02 List factors of worn out pump.
14.03 Explain vacuum leak.
14.04 Explain a steam or a water leak.
14.05 Define vacuum still pressure.
14.06 Explain how to clean dirty heating tubes.
14.07 Determine a faulty steam trap.
14.08 Diagnose an odor in a distilled solvent.

15.0 OPERATE PUMPS AT HIGHEST EFFICIENCY--The student will be able to:

15.01 Demonstrate the reducing or no flow of solvent.
15.02 Define the loss of pump prime.
15.03 Demonstrate the valves in either the suction or discharge line completely or partially closed.
15.04 Demonstrate the clogged strainers in suction line.
15.05 Determine the solvent level in tanks below the pump lines.
15.06 Explain the pump drive belt slipping.
15.07 Explain the pressure relief valve that is open on gear pumps.
15.08 Define the lint build up on the impeller in the pump.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Dry Cleaning and Laundering PROGRAM NUMBER: 8733000

COURSE TITLE: Dry Cleaning and Laundering 4 COURSE NUMBER: 8733040

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in machine maintenance and garment cleaning.

13.0 DEMONSTRATE TROUBLESHOOTING SKILLS--The student will be able to

13.01 Explain the use of the filter pressure gauge.
13.02 Explain plugged screens, tubes or bags.
13.03 Exhibit the ability to steam clean and boil screens or tubes, cleaning bags.
13.04 Describe in writing the distilling solvent.
13.05 Exhibit the ability to operate the pump on the filter.

29.0 ROUTINE MAINTENANCE--The student will be able to:

29.01 Determine causes of machine malfunction.
29.02 Perform preventative maintenance.
29.03 Perform shop housekeeping duties.
29.04 Explain and demonstrate proper handling and storage of flammable and/or toxic materials.

16.0 CLEAN GARMENTS--The student will be able to:

16.01 Demonstrate an understanding of what causes excessive redeposit.
16.02 Explain insufficient filter flow rate.
16.03 Define improper garment classification.
16.04 Explain dissolved garment classification.
16.05 Define excessive oils or greases in the solvent.

Dry Cleaning and Laundering 4 - Continued

16.06 Write how wrinkles occur in drycleaning.
16.07 Diagnose the causes of garments' streaks, slow drying or spotting rings.
16.08 Determine the reason for objectionable odors.
16.09 Define bleeding of dyes.
16.10 Describe dye or soil pick-up in local areas.
16.11 Explain restoration procedures of insoluble soil.
16.12 Demonstrate the method of softening plastic-coated fabrics.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Dry Cleaning and Laundering PROGRAM NUMBER: 8733000

COURSE TITLE: Dry Cleaning and Laundering 5 COURSE NUMBER: 8733050

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in operation of pressing and finishing machines.

17.0 ADJUST AND OPERATE UTILITY PRESSERS--The student will be able to:

17.01 Write the specifications for the utility press.
17.02 Demonstrate the ability to operate the utility press.
17.03 Perform the maintenance procedure.
17.04 Explain the variable pressure operation.
17.05 Explain the iron attachment.

18.0 ADJUST AND OPERATE MUSHROOM AND AUTOMATIC PANTS TOPPER--The student will be able to:

18.01 State the specifications for the topper press.
18.02 Demonstrate the operation of the pants topper.
18.03 Explain the timer on the automatic topper press.
18.04 Demonstrate the programmer adjustment procedures on the topper.

19.0 ADJUST AND OPERATE AUTOMATIC LEGGERS--The student will be able to:

19.01 State the specifications for the automatic legger.
19.02 Demonstrate the operation of the legger.
19.03 Define the timer on the legger.
19.04 Demonstrate the mechanical adjustment of the legger.

20.0 OPERATE FORM FINISHERS--The student will be able to:

20.01 List the specifications for the form finisher.
20.02 Explain the steps for the timer on form finisher.
20.03 Demonstrate the operation of the form finisher.
20.04 Perform the steps for finishing a coat.
20.05 Perform the steps for finishing a dress.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Dry Cleaning and Laundering PROGRAM NUMBER: 8733000

COURSE TITLE: Dry Cleaning and Laundering 6 COURSE NUMBER: 8733060

COURSE DESCRIPTION:

This course provides instruction in finishing various garments.

21.0 FINISH SLACKS AND SKIRTS--The student will be able to:

21.01 Demonstrate the steps necessary to place back, left hip of slacks on mushroom press.
21.02 Describe the steps necessary to place back right hip of slacks on mushroom press.
21.03 Demonstrate the steps necessary to place front, right hip of slacks on pres.
21.04 List the necessary steps to place front, left hip of slacks on press.
21.05 State the methods of legging slacks on regular press.
21.06 Demonstrate the methods necessary when finishing skirts.

22.0 FINISH COATS--The student will be able to:

22.01 State procedures for finishing coats on the form finisher and utility press.
22.02 Demonstrate steps in finishing sleeves on coats.
22.03 State methods of finishing coat collars.
22.04 Explain steps in finishing the front left shoulder and sleeve head.
22.05 State steps in finishing front lay.
22.06 Explain methods of finishing lapels.
22.07 Demonstrate steps in finishing linings.

23.0 FINISH TROUSERS--The student will be able to:

23.01 State the procedures in topping trousers on upright presser.
23.02 Demonstrate steps in finishing trouser tops or waistbands.
23.03 List steps in finishing pockets on trousers.
23.04 Demonstrate the steps in finishing left legs of trousers.
23.05 Demonstrate steps in finishing right legs of trousers.

24.0 FINISH DRESSES--The student will be able to:

24.01 State the operations for finishing sleeves on dresses.
24.02 Demonstrate the steps in finishing collars and lapels on dresses.
24.03 State the process of finishing blouses.
24.04 Demonstrate the steps for finishing skirts of dresses.

25.0 FINISH CHILDREN'S GARMENTS--The student will be able to:

25.01 List the methods of finishing a sleeve on a child's coat.
25.02 Demonstrate steps in finishing collars and trim.
25.03 Explain the steps in finishing fronts and backs of coats.
25.04 Demonstrate methods of finishing trousers.
25.05 List the steps for finishing boys' and girls' jackets.

26.0 FINISH PLEATS AND KNITTED GARMENTS--The student will be able to:

26.01 Demonstrate steps for finishing pleats.
26.02 State the procedure for finishing pleats on the sleeve board.
26.03 State methods for finishing pleats on the utility press.
26.04 State methods for finishing knitted garments.
26.05 Define the methods of measuring knitted garments before and after finishing.
26.06 List methods of handling finished knitted garments.

27.0 FINISH SILK--The student will be able to:

27.01 Explain the methods of finishing sleeves on the sleeve puff iron.
27.02 Demonstrate methods of finishing a skirt on the long press.
27.03 Describe the steps in finishing collars and lapels.
27.04 Describe the steps in finishing collars and lapels.
27.05 Demonstrate the steps in touch-up of finished garments.

28.0 INSPECT GARMENTS--The student will be able to:

28.01 Demonstrate methods of inspection.
28.02 Define the points of inspection in the order in which the work has gone through the various departments.
28.03 State the processes of inspecting garments which need special attention.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Dry Wall Installation

CODE NUMBER: Secondary ______ Postsecondary BCT0130

Florida CIP IN46.040400

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ______7-9 ______9-12 ______Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-17

CERTIFICATION COVERAGE: TEC CONSTR @ 7 BLDG CONST @ 7 DRYWALL 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as drywall applicators (61082001), tapers (61082003), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, use of ladders and scaffolds, materials, and tools, to install wallboard, plasterboard or other interior surfaces in structures.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the installation and finishing of drywall materials.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 6.0, Language 6.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 576 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Read and interpret blueprints and schematics.
02. Perform material and cost estimations.
03. Select, use and maintain tools and equipment.
04. Erect and use scaffolds, ladders, and stilts.
05. Install drywall on wood and metal framing.
06. Tape, compound, and finish drywall.
07. Demonstrate employability skills.
08. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Dry Wall Installation POSTSECONDARY NUMBER: BCT0130

01.0 READ AND INTERPRET BLUEPRINTS AND SCHEMATICS--The student will be able to:

01.01 Apply math skills.
01.02 Read scales and measuring instruments.
01.03 Read and interpret types of dimensions.
01.04 Read and interpret pictorial drawings.
01.05 Read and interpret supplemental information.
01.06 Read and interpret floor plan drawings.
01.07 Read and interpret schedules.
01.08 Read and interpret roofing-frame and ceiling plans.
01.09 Read and interpret specifications.
01.10 Read and interpret detail drawings and sketches.
01.11 Read, interpret and use symbols and abbreviations.
01.12 Prepare and use freehand sketches.
01.13 Prepare and use vertical, horizontal and overhead panel arrangements.

02.0 PERFORM MATERIAL AND COST ESTIMATIONS--The student will be able to:

02.01 Compile a list of supplies and materials from working drawings, written instructions or verbal instruction.
02.02 Compile labor costs.
02.03 Compile equipment rentals, leases and equipment costs to own and use.
02.04 Compile overhead costs.

03.0 SELECT, USE AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

03.01 Demonstrate knowledge of safety skills, first air, OSHA, Workers Compensation Law, workers liability and responsibility on the job site.
03.02 Apply safety rules and procedures at the job site and training site.
03.03 Demonstrate the safety devices, equipment and application of first aid.
03.04 Demonstrate the safe transportation, maintenance and storage of tools and equipment.
03.05 Demonstrate safe use of hand tools, reciprocating saw, sabre saw, drywall nailer, electric drill with depth adjusting clutch, mechanical taping tool, spray gun, finisher, adjustable stilts, automatic tape "banjo", portable power saw, ladders, scaffolds and power mixers.

04.0 ERECT AND USE SCAFFOLDS, LADDERS AND STILTS--The student will be able to:

04.01 Transport, assemble, use, disassemble and store scaffolding in accordance with industry practices and OSHA standards for wooden pole, tube and clamp, tubular welded frame and mobile categories.
04.02 Transport, set, adjust, use and store portable straight ladders and extension ladders including extensions.
04.03 Assemble, adjust, maintain and use adjustable stilts.

05.0 INSTALL DRYWALL ON WOOD AND METAL FRAMING--The student will be able to:

05.01 Select appropriate drywall materials according to type, thickness and edges requirements.
05.02 Measure and cut wallboard, including inside cuts, curves and irregular shapes.
05.03 Select and use appropriate fasteners or adhesives to mount wallboard to wooden framing, metal framing, new work or old work.
05.04 Fasten several types of metal corner beads and channel trim on edges and openings.
05.05 Apply single layer and double layer construction (two-ply) over wood framing.

06.0 TAPE, COMPOUND AND FINISH DRYWALL--The student will be able to:

06.01 Apply joint compound and reinforcing tape.
06.02 Apply pressure sensitive glass-fibre tape and compound.
06.03 Finish wallboard to receive other coverings.

07.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

07.01 Conduct a job search.
07.02 Secure information about a job.
07.03 Identify documents which may be required when applying for a job interview.
07.04 Complete a job application form correctly.
07.05 Demonstrate competence in job interview techniques.
07.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
07.07 Identify acceptable work habits.
07.08 Demonstrate knowledge of how to make job changes appropriately.
07.09 Demonstrate acceptable employee health habits.

08.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

08.01 Define entrepreneurship.
08.02 Describe the importance of entrepreneurship to the American economy.
08.03 List the advantages and disadvantages of business ownership.
08.04 Identify the risks involved in ownership of a business.
08.05 Identify the necessary personal characteristics of a successful entrepreneur.
08.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Electric Line Service and Repair

CODE NUMBER: Secondary ______ Postsecondary EET0540

Florida CIP IN46.030300

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-17

CERTIFICATION COVERAGE: ELECTRICAL 7 TEC ELEC @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as line repairers (821.361-026), line maintainers (821.261-014), line erectors (821.361-018), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, installation, operation, and maintenance of local, long distance, and rural power lines; erection and construction of pole and tower lines; and installation of underground lines.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the construction of utility power transmission lines and equipment used to conduct electrical energy between generating stations, substations, and consumers. All phases of overhead and underground power line installation is covered.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 576 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply basic electrical/electronic principles.
02. Install electrical distribution systems.
03. Perform street and security lighting activities.
04. Perform maintenance and inspection duties.
05. Troubleshoot and repair system components.
06. Utilize electrical line service tools and equipment.
07. Perform operator functions on high reach truck.
08. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Electric Line Service and Repair POSTSECONDARY NUMBER: EET0540

01.0 APPLY BASIC ELECTRICAL/ELECTRONIC PRINCIPLES--The student will be able to:

01.01 Interpret electrical terms.
01.02 Identify electrical symbols.
01.03 Construct common electrical circuits.
01.04 Compute for voltage, current, resistance and power.
01.05 Operate meters to measure electrical properties.
01.06 Discuss transformer theory.
01.07 Apply electronic principles where applicable.
01.08 Interpret electronic terms and symbols.

02.0 INSTALL ELECTRICAL DISTRIBUTION SYSTEMS--The student will be able to:

02.01 Set poles manually and using power equipment.
02.02 Transport, unload and position poles.
02.03 Frame pole.
02.04 Install guy anchor and wires.
02.05 Climb poles using climbing equipment.
02.06 Hoist materials or equipment to lines.
02.07 String conductors.
02.08 Cut or splice conductors.
02.09 Sag conductors.
02.10 Install tie wires.
02.11 Fabricate tie wires.
02.12 Install pole equipment (crossarms, transformers, fuse cutouts, insulators, air switches, arrestors and pole steps).
02.13 Install capacitor banks.
02.14 Install substation equipment.
02.15 Install utility meters.
02.16 Cut, thread, and bend metal conduit.
02.17 Install armor rods.
02.18 Install direct burial cable.
02.19 Install cable markers.
02.20 Fabricate underground duct systems.
02.21 Install underground cable ducts.
02.22 Rig manholes for cable pulling.
02.23 Splice high voltage underground cable.
02.24 Terminate high voltage cable underground and above ground.
02.25 Install cable racks.
02.26 Install and test grounding systems.

03.0 PERFORM STREET AND SECURITY LIGHTING ACTIVITIES--The student will be able to:

03.01 Install street light fixtures.
03.02 Install flood light fixtures.
03.03 Install lighting control components.
03.04 Install ballast.
03.05 Isolate system for test.
03.06 Adjust timers and controls.
03.07 Relamp fixtures.

04.0 PERFORM MAINTENANCE AND INSPECTION DUTIES--The student will be able to:

04.01 Control vegetation in powerline right-of-way.
04.02 Control vegetation in substations.
04.03 Inspect conductors for uniform sag.
04.04 Inspect poles and crossarms.
04.05 Check for corroded hardware.
04.06 Check fuse cutouts.
04.07 Check high voltage switches.
04.08 Check circuit breakers and regulators.
04.09 Inspect fences and warning signs.
04.10 Perform di-electric tests.
04.11 Perform load test.
04.12 Maintain all electrical components.
04.13 Recover equipment.
04.14 Read service meters.
04.15 Realign existing poles.
04.16 Pump water from manholes.
04.17 Check for deterioration of cable, connectors, and poles.

05.0 TROUBLESHOOT AND REPAIR SYSTEM COMPONENTS--The student will be able to:

05.01 Replace defective conductor.
05.02 Transfer dead conductor to new pole.
05.03 Remove foreign objects from conductor.
05.04 Transfer hot conductor to new pole.
05.05 Splice dead or hot conductors.
05.06 Convert transformer banks to open delta.
05.07 Replace crossarms.
05.08 Climb through hot equipment using rubber protective devices.
05.09 Trace faulty underground cable.
05.10 Replace substation breakers, transformers, regulators, and relays.

06.0 UTILIZE ELECTRICAL LINE SERVICE TOOLS AND EQUIPMENT--The student will be able to:

06.01 Utilize handtools safely.
06.02 Utilize hotline tools safely.
06.03 Utilize rubber protection as needed.
06.04 Operate pool trailer.
06.05 Operate reel jacks.
06.06 Operate cable pulling guide.
06.07 Operate shop power tools.
06.08 Operate hoist.
06.09 Operate climbing equipment.
06.10 Operate multimeter.
06.11 Operate clamp-on ammeter.
06.12 Operate phase rotation meter.
06.13 Operate meter.
06.14 Operate gas detector.
06.15 Operate hot stick tester.
06.16 Operate high voltage phase tester.
06.17 Operate recording ammeter/voltmeter.
06.18 Operate relay tester.
06.19 Operate vibro ground
06.20 Operate power trencher.
06.21 Clean facilities and shop.

07.0 PERFORM OPERATOR FUNCTIONS ON HIGH REACH TRUCK--The student will be able to:

07.01 Operate line maintenance truck.
07.02 Operate high reach.
07.03 Test reach booms.
07.04 Position truck safely.

08.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

08.01 Conduct a job search.
08.02 Secure information about a job.
08.03 Identify documents which may be required when applying for a job interview.
08.04 Complete a job application form correctly.
08.05 Demonstrate competence in job interview techniques.
08.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
08.07 Identify acceptable work habits.
08.08 Demonstrate knowledge of how to make job changes appropriately.
08.09 Demonstrate acceptable employee health habits.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Electric Motor and Generator Mechanics

CODE NUMBER: Secondary ______ Postsecondary EET0510

Florida CIP IN47.010700

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-17

CERTIFICATION COVERAGE: ELECTRICAL 7 TEC ELEC @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment with occupational titles as coil winder (724.684-026), propulsion motor and generator repairers (721.281-026), electric motor repairers (721.281-018)electric motor analysts (721.261-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the assembly, installation, testing, maintenance and repair of electric motors, generators, transformers and related equipment.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the use of tools and equipment required to test, maintain, and rebuild electric motors, ranging from domestic to commercial application.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1200 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of procedures.
02. Demonstrate knowledge of safety procedures.
03. Demonstrate knowledge of electrical fundamentals.
04. Demonstrate use of hand tools and bench skills.
05. Identify and describe operation of electrical and mechanical components of electric motors and controls.
06. Demonstrate use of test equipment.
07. Demonstrate understanding of theory and characteristics of electric motors.
08. Demonstrate troubleshooting skills.
09. Repair electric motors.

10. Perform rewinding operations.
11. Perform preventative maintenance.
12. Install component protectors and controls.
13. Select motor replacements.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Electric Motor and Generator Mechanics POSTSECONDARY NUMBER: EET0510

01.0 DEMONSTRATE KNOWLEDGE OF PROCEDURES--The student will be able to:

01.01 Demonstrate understanding of school policies and procedures.
01.02 Explain shop safety rules.
01.03 List opportunities and qualification for employment in the electric motor trade.

02.0 DEMONSTRATE KNOWLEDGE OF SAFETY PROCEDURES--The student will be able to:

02.01 Locate and identify types of fire extinguishers in classroom and shop areas.
02.02 Demonstrate the safe use of shop equipment.
02.03 Identify electrical shock hazards.

03.0 DEMONSTRATE KNOWLEDGE OF ELECTRICAL FUNDAMENTALS--The student will be able to:

03.01 Explain electrical theory in circuits as it relates to direct and alternating current.
03.02 Analyze and explain series, parallel and series - parallel circuits using Ohms law.
03.03 Explain magnetic theory as it relates to the production of electricity.
03.04 Recognize and draw basic electrical circuits and symbols.

04.0 DEMONSTRATE USE OF HAND TOOLS AND BENCH SKILLS--The student will be able to:

04.01 Name, identify, use and maintain hand tools.
04.02 Use and maintain measuring instruments.
04.03 Use and maintain drills.
04.04 Use and maintain grinders.
04.05 Use and maintain presses.
04.06 Use and maintain inpact tools.
04.07 Soft solder wires and components.
04.08 Perform acetylene welding, brazing, and cutting of ferrous and non-ferrous materials.
04.09 Perform electric welding and cutting.
04.10 Perform basic trueing on a metal lathe.
04.11 Perform basic straightening on a lathe.
04.12 Perform basic machining on a lathe.
04.13 Perform basic undercutting on a lathe.

05.0 IDENTIFY AND DESCRIBE OPERATION OF ELECTRICAL AND MECHANICAL COMPONENTS OF ELECTRIC MOTORS AND CONTROLS--The student will be able to:

05.01 Identify and describe electrical components and their function.
05.02 Adjust electrical components.
05.03 Identify, test and adjust mechanical components.

06.0 DEMONSTRATE USE OF TEST EQUIPMENT--The student will be able to:

06.01 Demonstrate the safe and proper use of basic test equipment.
06.02 Demonstrate the use of a volt-ohm meter to find voltage in a specific electrical circuit.
06.03 Demonstrate the use of a volt-ohm meter to find resistance in a specific electrical circuit.
06.04 Demonstrate various methods for testing electric motor windings and coils for grounds and shorts.
06.05 Test open circuits in windings.
06.06 Diagnose a burned-out winding, using odor, visual inspection and the use of test equipment.
06.07 Test related electrical components for electric motors using the proper equipment.

07.0 DEMONSTRATE UNDERSTANDING OF THEORY AND CHARACTERISTICS OF ELECTRIC MOTORS--The student will be able to:

07.01 Describe the operation of shaded pole motors.
07.02 Describe the operation of split phase motors.

07.03 Describe the operation of permanent split-capacitor motors.
07.04 Describe the operation of capacitor start motors.
07.05 Describe the operation of repulsion induction motors.
07.06 Describe the operation of capacitor start-capacitor run motors.
07.07 Read and interpret schematics for split phase motors.
07.08 Read and interpret schematics for permanent split-capacitor motors.
07.09 Read and interpret schematics for capacitor start motors.
07.10 Read and interpret schematics for shaded pole motors.
07.11 Read and interpret schematics for capacitor start-capacitor run motors.
07.12 Read and interpret schematics for repulsion induction motors.
07.13 Read and interpret line and circular diagrams for internal connections of basic single phase motors.
07.14 Read and interpret basic schematics for Wye(star) and Delta Polyphase motors.
07.15 Read and interpret line and circular diagrams for the internal connections of basic Wye(star) and Delta Polyphase motors.

08.0 DEMONSTRATE TROUBLESHOOTING SKILLS--The student will be able to:

08.01 Demonstrate proper troubleshooting techniques.
08.02 Perform visual and odor inspections.
08.03 Demonstrate proper use of VOM, series test light, armatures and megger.
08.04 Bench test for grounds.
08.05 Bench test for proper amperage.
08.06 Perform noise/sound tests.
08.07 Demonstrate use of factory reference manuals.
08.08 Troubleshoot grounded motor on component.
08.09 Locate open circuit in motor or component.
08.10 Locate short in motor or component.
08.11 Locate burned out fault in motor or component.

09.0 REPAIR ELECTRIC MOTORS--The student will be able to:

09.01 Properly mark parts and disassemble motors.
09.02 Complete work order for troubleshooting results, proper operating voltage, and direction of rotation, work to be done and work completed.
09.03 Visually inspect and test electrical and mechanical component parts.
09.04 Clean and lubricate component parts.
09.05 Adjust, service, and replace component parts.
09.06 Properly reassemble and safety bench test electric motors using the proper test equipment.
09.07 Demonstrate safe work habits while performing manipulative skills.
09.08 Wash and paint motors.
09.09 Clean or replace name plates.
09.10 Polish, dress and lubricate shafts.

10.0 PERFORM REWINDING OPERATIONS--The student will be able to:

10.01 Identify and record external lead and wiring connections.
10.02 Draw internal winding connections.
10.03 Complete accurate data card including external and internal connections and winding information.
10.04 Rewind and connect stators and armatures to industry standards.
10.05 Test winding for grounds, shorts and opens using the proper test equipment.
10.06 Demonstrate safe work habits while performing manipulative skills.

11.0 PERFORM PREVENTATIVE MAINTENANCE--The student will be able to:

11.01 Service, clean, lubricate and adjust components and motors while performing preventive maintenance.
11.02 Use proper safety precautions while performing preventive maintenance.

12.0 INSTALL COMPONENTS PROTECTORS AND CONTROLS--The student will be able to:

12.01 List the types and explain the application and operation of motor protectors listed.
12.02 List the types and explain the application and operation of motor controls listed.
12.03 Safely install component protectors and controls.

13.0 SELECT MOTOR REPLACEMENTS--The student will be able to:

- 13.01 Explain the information found on the motor nameplate as specified by the instructor.
- 13.02 Select proper motor replacements as specified by the instructor.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

- 14.01 Conduct a job search.
- 14.02 Secure information about a job.
- 14.03 Identify documents which may be required when applying for a job interview.
- 14.04 Complete a job application form correctly.
- 14.05 Demonstrate competence in job interview techniques.
- 14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
- 14.07 Identify acceptable work habits.
- 14.08 Demonstrate knowledge of how to make job changes appropriately.
- 14.09 Demonstrate acceptable employee health habits.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

- 15.01 Define entrepreneurship.
- 15.02 Describe the importance of entrepreneurship to the American economy.
- 15.03 List the advantages and disadvantages of business ownership.
- 15.04 Identify the risks involved in ownership of a business.
- 15.05 Identify the necessary personal characteristics of a successful entrepreneur.
- 15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK　　PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION　　EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Electrical/Electronics Drafting

CODE NUMBER: Secondary ______　　Postsecondary ETD0610

Florida CIP IN48.010400

SECONDARY SCHOOL CREDITS ______　　COLLEGE CREDITS ______　　POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9　____9-12　____Postsecondary Adult Vocational

______ Postsecondary Vocational　　x Other 13-17

CERTIFICATION COVERAGE: DRAFTING 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as blueprint machine operators (979.682-014), drafters, assistant (017.281-018), detailers (017.261-018), electrical drafters (003.281-010), electronic drafters (003.281-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, use of drafting tools and equipment, development of working drawings and wiring diagrams used by construction crews and repairers to install and repair electrical equipment, power plants, industrial establishments and commercial or domestic buildings, and development of wiring and schematic diagrams and layout drawings used to manufacture assemble, install and repair electrical and electronic equipment.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in drafting room procedures; operating blueprint machine and other duplicating equipment; use of technical manuals and other reference materials; use of light board; use of linking tools; computer assisted drawing; materials/supplies common to the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of orientation information.
02. Apply basic drafting skills.
03. Solve technical mathematical problems.
04. Prepare multi-view drawings.
05. Prepare sectional views.

06. Prepare auxiliary drawings.
07. Apply basic dimensioning.
08. Prepare pictorial drawings.
09. Prepare surface developments.
10. Utilize drafting applications.
11. Prepare basic charts and graphs.
12. Prepare basic computer-aided drawings.
13. Prepare basic architectural drawings.
14. Prepare basic structural details.
15. Prepare basic map drawings.
16. Prepare basic civil drawings.
17. Prepare basic electrical/electronic drawings.
18. Prepare basic pneumatic/hydraulic drawings.
19. Prepare computer-aided drawings.
20. Prepare advanced mechanical drawings.
21. Prepare electrical drawings.
22. Prepare electronic drawings.
23. Prepare advanced computer-aided drawings.
24. Demonstrate employability skills.
25. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Electrical/Electronics Drafting POSTSECONDARY NUMBER: ETD0610

01.0 DEMONSTRATE KNOWLEDGE OF ORIENTATION INFORMATION--The student will be able to:

01.01 Identify school, classroom and grading policies.
01.02 Apply safety practices.
01.03 Identify drafting careers and occupational concepts.
01.04 Identify course overview.
01.05 Locate resource materials and audio-visual training equipment.
01.06 Use reproduction equipment i.e., blueprint machines and office copy equipment.

02.0 APPLY BASIC DRAFTING SKILLS--The student will be able to:

02.01 Use drafting equipment, measuring scales, drawing media, drafting instruments and consumable materials.
02.02 Use conversion tables for fractions, decimals and metric measurements.
02.03 Identify the use of the alphabet of lines.
02.04 Prepare title blocks and other drafting formats.
02.05 Use various freehand and other lettering techniques.
02.06 Apply geometric, oblique and prospective sketches.
02.07 Prepare axonometric, oblique and prospective sketches.
02.08 Interpret reports and specifications.

03.0 SOLVE TECHNICAL MATHEMATICAL PROBLEMS--The student will be able to:

03.01 Solve arithmetic problems.
03.02 Solve algebra problems.
03.03 Solve trigonometric problems.
03.04 Solve geometry problems.
03.05 Apply multiple discipline calculations.

04.0 PREPARE MULTI-VIEW DRAWINGS--The student will be able to:

04.01 Select proper drawing scale, views and layout.
04.02 Prepare drawings containing horizontal and vertical surfaces.
04.03 Prepare drawings containing circles and/or arcs.
04.04 Prepare drawings containing incline surfaces.
04.05 Prepare drawings incorporating partial views.
04.06 Prepare drawings incorporating removed details and conventional breaks.

05.0 PREPARE SECTIONAL VIEWS--The student will be able to:

05.01 Prepare drawings containing full sections and half sections.
05.02 Prepare drawings containing offset sections.
05.03 Prepare drawings containing revolved sections.
05.04 Prepare drawings containing removed sections and broken-out sections.
05.05 Use conventional representation.
05.06 Prepare a sectional-assembly drawing applying material symbols.

06.0 PREPARE AUXILIARY DRAWINGS--The student will be able to:

06.01 Prepare drawings containing primary auxiliary views.
06.02 Prepare drawings containing auxiliary views that include curved lines.
06.03 Prepare drawings containing auxiliary sections.
06.04 Prepare drawings containing secondary auxiliary view.

07.0 APPLY BASIC DIMENSIONING--The student will be able to:

07.01 Prepare drawings containing linear standard dimensions.
07.02 Prepare drawings that include angular standard dimensions.
07.03 Prepare drawings include circular standard dimensions.
07.04 Prepare drawings using metric dimensions.
07.05 Prepare drawings using general and local notes.
07.06 Prepare drawings using surface characteristic notations.

08.0 PREPARE PICTORIAL DRAWINGS--The student will be able to:

08.01 Prepare isometric drawings.
08.02 Prepare dimetric drawings.
08.03 Prepare cavalier drawings.
08.04 Prepare cabinet drawings.
08.05 Prepare one and two point perspectives.

09.0 PREPARE SURFACE DEVELOPMENTS--The student will be able to:

09.01 Prepare drawings with sketchouts of prisms, cylinders, cones and pyramids.
09.02 Prepare sketchouts of a transition piece.
09.03 Prepare drawings involving intersecting pieces.

10.0 UTILIZE DRAFTING APPLICATIONS--The student will be able to:

10.01 Identify and use the various drafting and graphic appliques.
10.02 Use cut and paste techniques.
10.03 Identify and use photo techniques.
10.04 Prepare overlay drawings.
10.05 Make drawing changes on a sepia.
10.06 Apply inking techniques.

11.0 PREPARE BASIC CHARTS AND GRAPHS--The student will be able to:

11.01 Prepare bar, pie, and flow charts.
11.02 Prepare rectangular and semi-logarithmic graphs.

12.0 PREPARE BASIC COMPUTER AIDED DRAWINGS--The student will be able to:

12.01 Use full size standard keyboard.
12.02 Use dual disc drive console.
12.03 Use monitor.
12.04 Use digitizer.
12.05 Use plotter (single and multipen).
12.06 Format, transfer and operate diskette.
12.07 Produce multi-view drawings with dimensions.
12.08 Produce section view drawings with dimensions.
12.09 Produce auxiliary view drawings with dimensions.
12.10 Produce pictorial drawings.
12.11 Produce charts and graphs.

13.0 PREPARE BASIC ARCHITECTURAL DRAWINGS--The student will be able to:

13.01 Interpret vendors catalogs and technical tables.
13.02 Prepare floor plan drawings, with dimensions.
13.03 Prepare foundation plan and detail drawings, with dimensions.
13.04 Prepare elevation drawings with dimensions.
13.05 Prepare sections with dimensions
13.06 Prepare schedules.
13.07 Prepare landscape layouts.

14.0 PREPARE BASIC STRUCTURAL DETAILS--The student will be able to:

14.01 Interpret structural steel and reinforcing concrete manuals and technical tables.
14.02 Draw structural steel beam connections.
14.03 Draw reinforcing bar details.

15.0 PREPARE BASIC MAP DRAWINGS--The student will be able to:

15.01 Prepare traverse drawings.
15.02 Prepare plat drawings.
15.03 Prepare street layout drawings.
15.04 Prepare map drawings.

16.0 PREPARE BASIC CIVIL DRAWINGS--The student will be able to:

16.01 Prepare topographic drawings.
16.02 Prepare drainage drawings.
16.03 Prepare highway drawings.

17.0 PREPARE BASIC ELECTRICAL/ELECTRONIC DRAWINGS--The student will be able to:

17.01 Prepare schematic drawings.
17.02 Prepare printed circuit board drawings.
17.03 Prepare package drawings.

18.0 PREPARE BASIC PNEUMATIC/HYDRAULIC DRAWINGS--The student will be able to:

18.01 Prepare piping drawings.
18.02 Prepare pictorial diagrams.
18.03 Prepare cutaway diagrams.
18.04 Prepare graphical diagrams.
18.05 Prepare combination diagrams.

19.0 PREPARE COMPUTER-AIDED DRAWINGS--The student will be able to:

19.01 Produce architectural drawings.
19.02 Produce structural steel and reinforcing detail drawings.
19.03 Produce map drawings.
19.04 Produce civil drawings.
19.05 Produce electrical/electronic drawings.
19.06 Produce pneumatic/hydraulic drawings.

20.0 PREPARE ADVANCED MECHANICAL DRAWINGS--The student will be able to:

20.01 Resolve problems by descriptive geometry and revolutions.
20.02 Prepare advance surface drawings.
20.03 Identify the various manufacturing methods.
20.04 Use precision dimensioning to include geometric characters.
20.05 Make engineering changes on drawings.

21.0 PREPARE ELECTRICAL DRAWINGS--The student will be able to:

21.01 Analyze the basic theory of electricity.
21.02 Analyze the basic theory of circuitry.
21.03 Use electrical symbols.
21.04 Prepare single-line block diagrams.
21.05 Prepare a panel board schedule.

22.0 PREPARE ELECTRONIC DRAWINGS--The student will be able to:

22.01 Identify electronic device symbols.
22.02 Prepare schematic drawings.
22.03 Prepare printed circuit board drawings.
22.04 Prepare package drawings.
22.05 Prepare connection drawings.
22.06 Prepare interconnection drawings.
22.07 Prepare wiring lists.
22.08 Prepare cable drawings.
22.09 Prepare harness drawings.
22.10 Prepare component drawings.
22.11 Prepare logic diagrams.
22.12 Design an electromechanical unit.

23.0 PREPARE ADVANCED COMPUTER AIDED DRAWINGS--The student will be able to:

23.01 Produce schematic drawings.
23.02 Produce printed circuit board drawings.
23.03 Produce package drawings.
23.04 Produce connection drawings.
23.05 Produce interconnection drawings.
23.06 Produce wiring lists.
23.07 Produce cable drawings.
23.08 Produce harness drawings.
23.09 Produce component drawings.
23.10 Produce logic diagrams.

24.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

24.01 Conduct a job search.
24.02 Secure information about a job.
24.03 Identify documents which may be required when applying for a job interview.
24.04 Complete a job application form correctly.
24.05 Demonstrate competence in job interview techniques.

24.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
24.07 Identify acceptable work habits.
24.08 Demonstrate knowledge of how to make job changes appropriately.
24.09 Demonstrate acceptable employee health habits.

25.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

25.01 Define entrepreneurship.
25.02 Describe the importance of entrepreneurship to the American economy.
25.03 List the advantages and disadvantages of business ownership.
25.04 Identify the risks involved in ownership of a business.
25.05 Identify the necessary personal characteristics of a successful entrepreneur.
25.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK
PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION
EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Electrical Technology

CODE NUMBER: Secondary ______ Postsecondary EER0000

Florida CIP IN15.030200

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-15

CERTIFICATION COVERAGE: TEC ELEC @ 7 ELECTRONIC 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as electrical technicians (003.161-010), calibration laboratory technicians (019.281-010), research electricians (726.281-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and skills to support an electrical engineer in the design, development, and testing of electrical circuits, devices, and systems for generating electricity and distributing electrical power.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in model and prototype development and testing, systems analysis and integration, design and development of corrective and preventative maintenance techniques, application and engineering data, and preparation of reports and test data.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of work practices and electric codes.
02. Read blueprints and schematics.
03. Demonstrate basic electric wiring skills.
04. Demonstrate understanding of DC circuits.
05. Demonstrate understanding of AC circuits.
06. Install and troubleshoot residential wiring circuits from service entrance to convenience outlets.
07. Install and troubleshoot commercial wiring circuits.
08. Design an electrical system.
09. Modify electrical circuits.

Electrical Technology - Continued

10. Perform preventative and corrective maintenance on controls and components.
11. Develop cost estimates.
12. Write technical reports.
13. Analyze electrical systems.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Electrical Technology POSTSECONDARY NUMBER: EER0000

01.0 DEMONSTRATE KNOWLEDGE OF WORK PRACTICES AND ELECTRIC CODES--The student will be able to:

01.01 Describe trade employment opportunities and job titles.
01.02 Describe trade ethics.
01.03 Describe working conditions of the trade in various job titles.
01.04 Describe qualifications for employment.
01.05 Describe values of apprenticeship program and responsibilities of the apprentice.
01.06 Demonstrate knowledge of safety skills, first aid, OSHA, Workers Compensation Law, workers liability and responsibility on the job or training site.
01.07 Apply safety rules and procedures at the job site.
01.08 Demonstrate the use of safety devices, equipment and application of first aid.
01.09 Demonstrate an understanding and need for the National Electric Code and local code.
01.10 Demonstrate the safe use of hand tools, ladders and scaffolding, portable electric tools, fixed electrical tools and machines, controls (electrical, hydraulic and pneumatic), transformers, supplies, materials, testing equipment, motors, generators, alternators and power distribution equipment.

02.0 READ BLUEPRINTS AND SCHEMATICS--The student will be able to:

02.01 Demonstrate an understanding of an ability to use working drawings.
02.02 Demonstrate the ability to use schematic diagrams.
02.03 Demonstrate the ability to describe, identify and use symbols and abbreviations.
02.04 Demonstrate the ability to interpret and use field notes, technical manual information, operational and maintenance technical notes, bulletins and manuals, service literature and installation information.
02.05 Demonstrate the ability to modify and perform field changes to original information from written or verbal directions.
02.06 Demonstrate the ability to perform mathematical calculations utilizing arithmetic, algebra, geometry, and trigonometry.
02.07 Demonstrate the ability to read and convert English system and metric system measurements.
02.08 Demonstrate the ability to use line diagrams, schematics, assembly drawings, balloon drawings, exploded views, floor plans, detail drawings, and conversion and reference charts.
02.09 Demonstrate the ability to use measuring tools and scales.
02.10 Demonstrate the ability to identify and use drafting instruments and equipment, including CAD systems to produce the various types of drawing and graphics information identified in 01.01, 01.02, 02.08.
02.11 Demonstrate the ability to produce logical, neat and usable freehand sketches and field notes, revisions or modifications.

03.0 DEMONSTRATE BASIC ELECTRIC WIRING SKILLS--The student will be able to:

03.01 Demonstrate an understanding of and ability to use the National Electric Code and local building codes.
03.02 Demonstrate the ability to identify and use electric terminals, connectors, cable clamps, grommets, ties, metric and standard bolts, screws and nuts, power drive fasteners, washers, anchors, and wire nuts.
03.03 Demonstrate the ability to identify commonly used wire and cable relative to type, size, cost and applications.
03.04 Demonstrate the ability to identify, maintain and use metric and standard hand tools including, screw drivers, torx drivers, wrenches, pliers, wire cutters, wire strippers, soldering and desoldering tools, masonry drills and bits, fish tape, measuring tools, knives, files, saws, taps and dies, threader, pipe and conduit benders, stepladder and extension ladders, combination square, carpenters square, propane torch, wire and drill gauges, greenlee punches, plumb bob, and allen wrenches. NOTE: The tools listed above is not a complete inventory necessary to conduct the entire program of Electrical Technology.

03.05 Demonstrate the ability to identify, maintain and use pedestal grinder, portable electric drill, pipe vise, neon test probe, Amprobe, rigid portable trist and vise, reciprocating saw, circular saw, jig saw and stud driver. NOTE: This is not a complete equipment inventory for the entire Electrical Technology program.
03.06 Select appropriate materials, fixtures and controls utilizing information on blueprints or schematics.
03.07 Select, measure, cut and prepare wire to make circuits.
03.08 Connect wiring to appropriate controls, fixtures and devices mounted on a trainer or wiring board to complete operational circuits in accordance with NEC and acceptable trade practices.
03.09 Make continuity tests for shorts and open circuits.
03.10 Test for voltage at source, conductors and outlets.
03.11 Design, construct and troubleshoot simple circuits on experimental proto type boards.
03.12 Design, construct and troubleshoot simple circuits on printed circuit boards.

04.0 DEMONSTRATE UNDERSTANDING OF DC CIRCUITS--The student will be able to:

04.01 List the fundamental properties of matter.
04.02 Describe the structure of an atom.
04.03 Explain the basic electrical concepts of current, voltage, resistance and electrical polarity.
04.04 Define Ohm's Law.
04.05 Describe the basic relationships of voltage, current, and resistance in a series circuit.
04.06 Apply Ohm's Law to determine unknown quantities.
04.07 Construct series circuits and apply Ohm's Law.
04.08 Describe the characteristics of parallel circuits.
04.09 Demonstrate procedures to solve parallel circuit problems, utilizing Ohm's Law.
04.10 Construct parallel circuits and apply Ohm's Law.
04.11 Explain the characteristics of series-parallel circuits.
04.12 Demonstrate procedures for solving problems involving series-parallel circuits.
04.13 Construct series-parallel circuits and apply Ohm's Law.
04.14 Explain the relationship of work to power.
04.15 Apply power and energy concepts to practical problems.
04.16 Calculate wattage for a given circuit and verify calculations, utilizing voltmeter, ammeter and wattmeter.
04.17 Describe safe procedures for handling, storing, charging and installing storage batteries.
04.18 Describe electrical characteristics of lead-acid storage batteries, dry cells and NiCads.
04.19 Describe factors that determine resistance of conductors and calculate resistance of conductors.
04.20 Use correctly B & S wire gauge, tables and micrometer.
04.21 Describe the principles of voltage drop across conductors.
04.22 Demonstrate problem solving techniques involved in the selection of conductors.
04.23 Describe the properties of magnets.
04.24 Describe the basic principles of magnetism.
04.25 Describe the basic principles of electromagnetism.
04.26 Demonstrate how to determine the direction of magnetic fields.
04.27 Explain how a magnetic field is created in a coil of wire.
04.28 Demonstrate an understanding of and use of Kirchoffs voltage and current laws, Faradays law and Lenz's law.
04.29 Demonstrate an understanding of the principles involved in the production of an electromotive force.
04.30 Demonstrate the determination of the direction of a current carrying conductor within a magnetic field.
04.31 Demonstrate an understanding of meter circuits.
04.32 Demonstrate an understanding of capacitance and time constants in DC circuits.

05.0 DEMONSTRATE UNDERSTANDING OF AC CIRCUITS--The student will be able to:

05.01 Demonstrate an understanding of the characteristics of alternating current.
05.02 Describe the generation of alternating current.
05.03 Define alternating current terminology.
05.04 Identify and define an inductive circuit.
05.05 Define self-inductance and mutual inductance.
05.06 Define and calculate inductive reactance.

05.07 Demonstrate the relationship between voltage and current in inductive circuits by the use of vectors.
05.08 Define the characteristics of capacitance.
05.09 Describe and prove the effects of capacitance in alternating circuits.
05.10 Define and calculate capacitive reactance.
05.11 Demonstrate the relationship between voltage and current and voltage in capacitive circuits, using vectors.
05.12 Describe current-voltage relationship in AC series circuits containing resistance and inductance.
05.13 Apply vectors to the analysis of an RL series circuit.
05.14 Describe the relationships of voltage and current in a series circuit containing resistance and capacitance.
05.15 Apply vectors to the analysis of an RC series circuit.
05.16 Describe the effects of a combination of resistance, inductance, and capacitance connected in a series circuit.
05.17 Describe the effects of a combination of resistance, inductance, and capacitance connected in series.
05.18 Explain the relationships of voltage and current in a series RLC AC circuit.
05.19 Identify resonance in an AC circuit.
05.20 Determine and explain the relationships in an alternating current circuit containing a resistor connected parallel with an inductor.
05.21 Product vector analysis for RL parallel circuits.
05.22 Determine and explain current and voltage relationships in an alternating current circuit containing resistance and capacitance in parallel.
05.23 Determine and explain current and voltage relationships in an alternating current circuit containing resistance, inductance, and capacitance in parallel.
05.24 Determine and explain current and voltage relationships in an alternating current circuit containing resistance, inductance, and capacitance in series-parallel.
05.25 Calculate power in AC circuits.
05.26 Calculate and explain power factor.
05.27 Calculate and explain power factor correction.

06.0 INSTALL AND TROUBLESHOOT RESIDENTIAL WIRING CIRCUITS FROM SERVICE ENTRANCE TO CONVENIENCE OUTLETS--The student will be able to:

06.01 Demonstrate the ability to use blueprints and specifications to determine power requirements, distribution, and construction considerations to meet the needs for a safe and functional electrical system for single family dwellings.
06.02 Determine the size of service entrance equipment, supplies and conductors.
06.03 Select the proper materials, equipment and supplies.
06.04 Demonstrate proper methods to install service entrance, lighting circuits, small appliance circuits, and circuits for garbage disposal, dishwasher, dryer, oven, stove, air conditioner, water heater and space heating.
06.05 Demonstrate understanding of and ability to use the NEC, local codes, utility regulations, special ordinances and installation instructions.
06.06 Demonstrate an understanding of building permits and insurance responsibilities.
06.07 Demonstrate troubleshooting and repair techniques for "new" and "old" work using industry standard testing equipment.
06.08 Demonstrate knowledge and ability to install optional electrical safety devices, special fixtures (explosion proof, waterproof), communications and alarm systems, timers and controllers.

07.0 INSTALL AND TROUBLESHOOT COMMERCIAL WIRING CIRCUITS--The student will be able to:

07.01 Demonstrate an understanding of DC motor theory and construction including series, shunt and compound motors.
07.02 Demonstrate an understanding of DC motor torque, efficiency, speed regulation, loading and starters.
07.03 Demonstrate an understanding of and ability to perform maintenance procedures and install DC motors.

07.04 Demonstrate an understanding of and the ability to install DC motor starting rheostats, DC manual speed controllers, automatice motor controls, DC CEMF motor controllers, DC series lockout relay acceleration controllers, and dynamic braking/DC motor reversal controls, solid state controls and computerized controls.
07.05 Demonstrate an understanding of DC generators theory and construction for separately excited DC generator, self excited shunt generator, and compound wound DC generators (under, flat, over and differential).
07.06 Demonstrate an understanding of and ability to install troubleshoot and maintain DC generators.
07.07 Demonstrate ability to calculate requirements to parallel DC generators.
07.08 Parallel DC generators.
07.09 Demonstrate the ability to correctly apply testing and monitoring equipment to DC motor and DC generator circuits and machines.
07.10 Select and apply DC motor controls.
07.11 Demonstrate an understanding of single phase AC motors classified as shaded pole, split phase, capacitor repulsion and series.
07.12 Demonstrate the ability to select, connect, troubleshoot and maintain single phase AC motors.
07.13 Demonstrate an understanding of three phase AC motors classified as squirrel-cage induction motor, wound rotor induction motor and synchronous motor.
07.14 Demonstrate the ability to select, connect, troubleshoot and maintain three phase AC motors.
07.15 Demonstrate the ability to correctly apply testing and monitoring equipment to AC 3-phase motors.
07.16 Select and apply AC motor controls.
07.17 Demonstrate an understanding of the theory, physical and electrical characteristics of three phase alternators.
07.18 Demonstrate an understanding of the theory and application for engine driven generating sets, including types of prime movers and transfer switches.
07.19 Demonstrate an understanding of theory to parallel three phase alternators.
07.20 Parallel 3-phase alternators.
07.21 Demonstrate the ability to select, troubleshoot, connect and maintain 3-phase alternators.
07.22 Demonstrate the ability to apply testing and synchronizing equipment to 3-phase alternators.
07.23 Demonstrate an understanding of the theory and application for rotary converters.
07.24 Demonstrate the ability to select, troubleshoot, connect and maintain rotary converters.
07.25 Demonstrate the ability to apply testing and monitoring equipment to rotary converters.
07.26 Demonstrate an understanding to transformer theory and applications.
07.27 Demonstrate an understanding of single phase transformer theory and applications.
07.28 Demonstrate an understanding of single phase three wire secondary system.
07.29 Demonstrate an understanding of theory and applications for single phase transformers connected in Delta.
07.30 Demonstrate an understanding of theory and applications for single phase transformers connected in Wye.
07.31 Demonstrate an understanding of theory and applications for transformers connected in the following configurations: wye-wye, wye-delta, delta-delta, delta-wye, wye-open-delta and four wire wye-wye.
07.32 Connect transformers in the configurations identified in 07.31.
07.33 Apply testing and monitoring equipment to transformers and their associated circuits.
07.34 Install transformers to primary service and main switch metering equipment and secondary switching.
07.35 Install transformer overcurrent protection.
07.36 Install rigid conduit, EMT, flexible metal conduit, and rigid non-metallic conduit.
07.37 Select correct size conduits for branch circuits.
07.38 Select correct size and number of conductors for each branch conduit.
07.39 Select appropriate metal conduit fittings and boxes.
07.40 Select and install a panel board, given the number of required circuits and their load.
07.41 Connect branch circuits to panel board.

07.42 List and identify types, classes and ratings of fuses and breakers.
07.43 Describe operation of fuses and breakers.
07.44 Install fuses and breakers and apply the NEC to the selection and installation of overcurrent protection devices.
07.45 Select and apply branch-circuit and overload protection for appliances.
07.46 Install busways and raceways.
07.47 Install low-voltage remote lighting.
07.48 Demonstrate an understanding of the principles of illumination including: parking lot and street lighting, shop and office lighting, luminary placement, types and styles, applications, loading, power requirements, installation requirements, efficiency, cost, and Code requirements.
07.49 Demonstrate basic principles of electronics including: transistors, semi-conductor devices, op-amps, field-effect transistors, thyristors, special purpose diodes, CRT's transistor amplifiers, power supplies, digital electronics, integrated circuits, oscillators, linear IC applications, microprocessors, and computer basics.
07.50 Perform practical testing, troubleshooting and repair transistor amplifiers, digital circuits, analog circuits, OP-amps, oscillators, power supplies, microprocessors, programmable controls and solid state devices utilizing state-of-the-art testing and analyzing equipment.
07.51 Demonstrate an understand of the theory and practical applications of servomechanisms.
07.52 Draw ladder diagrams, write programs and implement machine controls.

08.0 DESIGN AN ELECTRICAL SYSTEM--The student will be able to:

08.01 Determine electric service requirements for commercial buildings.
08.02 Determine branch circuits requirements.
08.03 Determine appliance circuits requirements.
08.04 Determine overcurrent protection requirements.
08.05 Determine grounding and bonding requirements.
08.06 Determine remote control and low voltage remote control requirements.
08.07 Determine lighting requirements.
08.08 Determine power and wiring requirements for heating and cooling equipment.
08.09 Determine requirements necessary to provide emergency power and lighting.
08.10 Prepare lists of materials, supplies and equipment necessary to power up commercial buildings.

09.0 MODIFY ELECTRICAL CIRCUITS--The student will be able to:

09.01 Redesign entrance service requirements for building expansion, renovation or installation of heavy powered equipment not accounted for under original construction.
09.02 Relocate or modify branch circuits and panel boxes to accommodate building expansion, renovation or relocation of equipment or addition of equipment which will require additional electrical power.
09.03 Reprogram machines and controllers as renovations and equipment needs require.
09.04 Relocate and modify initially installed systems and equipment.

10.0 PERFORM PREVENTATIVE AND CORRECTIVE MAINTENANCE ON CONTROLS AND COMPONENTS--The student will be able to:

10.01 Use technical data and manuals to perform preventative maintenance.
10.02 Clean, adjust and calibrate electrical machines, circuits, controllers and components.
10.03 Demonstrate ability to select and apply appropriate tools and testing equipment.
10.04 Demonstrate the ability to apply appropriate and sequential procedures for preventative maintenance.
10.05 Perform corrective preventative maintenance and certify completion.
10.06 Determine the need for corrective maintenance by applying troubleshooting and analysis techniques.
10.07 Select appropriate tools, test equipment, and parts to perform maintenance.
10.08 Replace parts and calibrate or adjust as necessary to bring equipment, systems, components or machines to specifications.

10.09 Prepare forms and reports of preventative and corrective maintenance.

11.0 DEVELOP COST ESTIMATES--The student will be able to:

11.01 Utilize blueprints, specifications and construction schedules to identify materials, supplies and equipment which will be needed for construction of buildings, maintenance or repair of structures or electrical contents and circuitry on or within the property.
11.02 Prepare lists in appropriate format of materials, supplies and equipment for bidding process.
11.03 Prepare a list of conditions for each supplier and contractor which must be met if a bid is accepted.
11.04 Analyze bids for acceptably and alternatives.
11.05 Prepare a final estimate to include owner optional costs, such as legal fees, use of company personnel, property costs, permits, utilities and inventory costs, engineering fees, rentals and insurance, as needed.
11.06 Prepare a final report to include all specifications, bid analysis, recommendations and alternate recommendations.

12.0 WRITE TECHNICAL REPORTS--The student will be able to:

12.01 Explain the need to have the capability to prepare clear and concise communications in the form of technical reports and papers.
12.02 Define a fact.
12.03 Demonstrate the ability to locate facts utilizing records and libraries.
12.04 Take notes, use footnotes, references and bibliographies.
12.05 Organize an outline.
12.06 Prepare draft parts of a formal report.
12.07 Finalize draft parts of the formal report, taking into account validity of facts, audience, appropriate language and timing.
12.08 Prepare conclusion and final draft.
12.09 Secure copyright releases.
12.10 Apply for copyrights.
12.11 Arrange for printing reports and secure estimates for printing and distribution.

13.0 ANALYZE ELECTRICAL SYSTEMS--The student will be able to:

13.01 Demonstrate an understanding of analyzing principals.
13.02 Systematically and theoretically determine and locate system faults.
13.03 Evaluate system faults, apply analysis techniques and testing equipment.
13.04 Verify system fault.
13.05 Produce recommendations to correct and avoid identified system faults.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Electromechanical Technology

CODE NUMBER: Secondary ______ Postsecondary EER0500

Florida CIP IN15.040300

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-15

CERTIFICATION COVERAGE: TEC MECH @ 7 TEC ELEC @ 7
ELECTRONIC 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as electromechanical equipment assemblers A (61080423), electromechanical equipment assemblers B (61080429), electromechanical (robotics) technicians (710.281-018), automated process electronics technicians, or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, assembly, maintenance and repair of electromechanical devices and systems as plant automation, automated control systems, servomechanisms, and auxiliary equipment. Includes instruction in feasibility testing of engineering concepts.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the use of tools, test equipment, materials, and processes similar to those used in industry. Students use the various types of precision test equipment found in general use throughout the electronics industry for the purpose of analyzing, troubleshooting, and repairing robotics and automation equipment.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 2160 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in DC electronics through problem solving, use of circuit diagrams and schematics, identification and application of components and circuits, use of appropriate tools and test equipment, and troubleshooting procedures.

02. Demonstrate proficiency in AC electronics through problem solving, use of circuit diagrams and schematics, identification and application of components and circuits, use of appropriate tools and test equipment, and troubleshooting procedures.
03. Demonstrate proficiency in semiconductor devices and circuits through problem solving, use of circuit diagrams and schematics, identification and application of tools and test equipment and troubleshooting procedures.
04. Demonstrate proficiency in electronic circuits through problem solving, use of circuit diagrams and schematics, identification and application of components, use of appropriate tools and test equipment, and troubleshooting procedures.
05. Demonstrate leadership skills and human relations skills.
06. Demonstrate proficient soldering and chassis assembly technique.
07. Demonstrate proficiency in analysis methodology.
08. Demonstrate proficiency in digital circuits and devices through problem solving, use of circuit diagrams and schematics, identification and application of components and circuits, use of appropriate tools and test equipment, and troubleshooting procedures.
09. Demonstrate proficiency in microprocessors through problem solving use of circuit diagrams and schematics, identification and application of components and circuits, use of appropriate tools and test equipment, and troubleshooting procedures.
10. Demonstrate proficiency in preparing technical records and reports.
11. Demonstrate proficiency in mechanics/micromechanics through knowledge of materials (metals and composite) specifications and mechanical and micromechanical systems using blueprints, manufacturer's specifications, tools, test equipment and troubleshooting procedures.
12. Demonstrate proficiency in sensor and feedback devices through knowledge of transducers, motor controls, synchros and resolvers, pattern recognition systems, pulse encoders and farrand scales using engineering specifications, tools, test equipment and troubleshooting procedures.
13. Demonstrate proficiency in hydraulic, pneumatic vacuum systems through knowledge of pumps, control and metering devices; electromechanical valves and valve, linear and rotary actuators; pressure and flow regulators; hydraulic, pneumatic and vacuum devices and piping; reservoirs and fittings.
14. Demonstrate proficiency in the application of feedback systems through knowledge of external feedback, hierarchical control techniques, robotic interfacing and related robotic feeding equipment.
15. Demonstrate proficiency in pre-operational procedures of robotics systems using engineering specifications, blueprints, checklists.
16. Demonstrate proficiency in operational procedures of robotic systems using engineering specifications, systems parameters and checklists.
17. Demonstrate proficiency in post-operational procedures of robotic systems using engineering specifications, system parameters, system diagnostics, tools and equipment.
18. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS

ELECTROMECHANICAL TECHNOLOGY

01.0 DEMONSTRATE PROFICIENCY IN DC ELECTRONICS THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF APPROPRIATE TOOLS AND TEST EQUIPMENT, AND TROUBLESHOOTING PROCEDURES — The student will be able to:

01.01 Solve electronic math problems related to DC circuits including series, parallel, and series-parallel circuits.
01.02 Identify and define electron theory and sources of electrical energy.
01.03 Define the relationship between current, voltage, resistance and power.
01.04 Solve basic electronic problems involving current, voltage, resistance and power.
01.05 Identify and measure resistors.
01.06 Use an analog and digital multimeter to measure current, voltage, resistance, and continuity of passive components.
01.07 Draw, analyze, construct and troubleshoot series circuits.
01.08 Draw, analyze, construct and troubleshoot parallel circuits.
01.09 Draw, analyze, construct and troubleshoot series parallel circuits.
01.10 Draw, analyze, construct and troubleshoot voltage divider circuits.
01.11 Demonstrate a knowledge of magnetism and electromagnetism.
01.12 Analyze and calculate RL and RC time constants.
01.13 Set up and operate power supplies for DC circuits.
01.13 Set up and operate power supplies for DC circuits.
01.14 Set up and operate oscilloscopes for DC circuits.
01.15 Troubleshoot and locate defective components in a functional DC circuit consisting of resistors, relays, lamps, switches, fuses, inductors, rheostats, potentiometers, capacitors, conductors, and power supplies.

02.0 DEMONSTRATE PROFICIENCY IN AC ELECTRONICS THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF APPROPRIATE TOOLS AND TEST EQUIPMENT, AND TROUBLESHOOTING PROCEDURES — The student will be able to:

02.01 Solve electronics math problems related to AC circuits including: RC, RL, RLC, LC, and Z for series, parallel and series-parallel circuits.
02.02 Identify properties of an AC sineusoidal waveform.
02.03 Use an analog and digital multimeter to measure current, voltage, resistance, and continuity of passive components.
02.04 Draw, analyze, construct, and troubleshoot AC resistive circuits.
02.05 Draw, analyze, construct, and troubleshoot series, parallel, and series-parallel capacitive and resistive-capacitive circuits.
02.06 Draw, analyze, construct, and troubleshoot series, parallel, and series-parallel inductive and resistive-inductive circuits.
02.07 Draw, analyze, construct, and troubleshoot series, parallel, and capacitive-inductive circuits.
02.08 Draw, analyze, construct, and troubleshoot transformer circuits.
02.09 Draw, analyze, construct, and troubleshoot series, parallel, and series-parallel resistive-capacitive-inductive circuits.
02.10 Draw, analyze, construct, and troubleshoot series and parallel resonant circuits.
02.11 Draw, analyze, construct, and troubleshoot low-pass, high-pass, bandpass, and reject active filters.
02.12 Analyze basic motor and generator theory and operation.
02.13 Set up and operate power supplies for AC circuits.
02.14 Set up and operate oscilloscopes for AC circuits.
02.15 Set up and operate frequency counters for AC circuits.
02.16 Set up and operate signal generators for AC circuits.
02.17 Troubleshoot and locate defective components in a functional AC circuit consisting of resistors, capacitors, inductors, and transformers.

03.0 DEMONSTRATE PROFICIENCY IN SEMICONDUCTOR DEVICES AND CIRCUITS THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF TOOLS AND TEST EQUIPMENT AND TROUBLESHOOTING PROCEDURES — The student will be able to:

03.01 Identify properties of semiconductor material.
03.02 Analyze and measure characterisitics of P-N diodes.
03.03 Analyze and measure characteristics of special diodes, including: tunnel rectifier, zener, varactor.
03.04 Analyze and measure characteristics of Bioplar Junction Transistors (BJT).
03.05 Analyze and measure characteristics of Field Effect Transistor (FET).
03.06 Analyze and measure characteristics of Medal Oxider Semiconductor Field Effect Transistor (MOSFET).

03.07 Analyze and measure characteristics of of Thyristors.
03.08 Analyze and measure characteristics of Optoelectronic devices.
03.09 Analyze and measure characteristics of of Operational Amplifiers (OpAmp).
03.10 Describe Integrated Circuits: importance, construction, and application in digital and linear circuits.
03.11 Set up and operate multimeters for solid state devices.
03.12 Set up and operate oscilloscopes for solid state devices.
03.13 Set up and operate curve tracers for solid state devices.
03.14 Set up and operate transistor testers for solid state devices.

04.0 DEMONSTRATE PROFICIENCY IN ELECTRONICS CIRCUITS THROUGH PROBLEM SOLVING, USE OF CIRCUITS DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS, USE OF APPROPRIATE TOOLS AND TEST EQUIPMENT, AND TROUBLESHOOTING PROCEDURES — The student will be able to

04.01 Draw, analyze, construct, and troubleshoot diode circuits.
04.02 Draw, analyze, construct, and troubleshoot power supply, regulator, and filter circuits.
04.03 Draw, analyze, construct, and troubleshoot single-stage amplifier circuits.
04.04 Draw, analyze, construct, and troubleshoot multi-stage amplifier circuits.
04.05 Draw, analyze, construct, and troubleshoot oscillator circuits.
04.06 Draw, analyze, construct, and troubleshoot wave-shaping circuits.
04.07 Draw, analyze, construct, and troubleshoot operational amplifier circuits.
04.08 Draw, analyze, construct, and troubleshoot active filter circuits.
04.09 Set up and operate multimeters for analog circuits.
04.10 Set up and operate oscilloscopes for analog circuits.
04.11 Set up and operate frequency counters for analog circuits.
04.12 Set up and operate signal generators for analog circuits.
04.13 Set up and operate transistor testors for analog circuits.

05.0 DEMONSTRATE LEADERSHIP SKILLS AND HUMAN RELATION SKILLS — The student will be able to:

05.01 Demonstrate leadership abilities and human relations skills through participation in educational, vocational, civic, recreational and social activities.
05.02 Demonstrate skills in parliamentary procedure.

06.0 DEMONSTRATE PROFICIENT SOLDERING AND CHASSIS ASSEMBLY TECHNIQUE —The student will be able to:

06.01 Select, maintain, and use soldering and desoldering tools.
06.02 Use solders with different tin/lead percentages.
06.03 Solder conductors and components to: turret, cup, bifurcated, hooked, pierced terminals and connectors.
06.04 Solder axial lead components to Printed Circuit (PC) boards.
06.05 Remove components and conductors from terminals without damage, including: IC's, TO-5, transistors, diodes, transformers and controls.
06.06 Repair damaged PC board circuitry.

07.0 DEMONSTRATE PROFICIENCY IN ANALYSIS METHODOLOGY — The student will be able to:

07.01 Analyze circuits using: Kirchoff's Current, and Voltage Laws, Superposition, Thevenin's and Norton's Theorems, "T", "Pi", and Bridge Networks.
07.02 Analyze circuits using Wheatstone and LCR Bridge

08.0 DEMONSTRATE PROFICIENCY IN DIGITAL CIRCUITS AND DEVICES THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF APPROPRIATE TOOLS AND TEST EQUIPMENT, AND TROUBLESHOOTING PROCEDURES — The student will be able to:

08.01 Identify number systems and solve digital math problems using: binary, octal, and hexadecimal radix; and solve boolean algebra problems.
08.02 Identify characteristics of Integrated Circuits (IC) logic families using: Resistor-Transistor Logic (RTL), Diode-Transistor Logic (DTL), Transistor-Transistor Logic (TTL), Emitter-Cooupled Logic (ECL), MOS, and Complementary-MOS.
08.03 Draw, analyze, construct and troubleshoot OR/NOR, AND/NAND, XOR gates.
08.04 Analyze and minimize logic circuits using: Boolean Algebra and Karnaugh Maps.
08.05 Draw, analyze, construct and troubleshoot Flip-Flops and Latches circuits using: "R-S", "D", "T", AND "J-K" devices.
08.06 Draw, analyze, construct, and troubleshoot clock and timing circuits.
08.07 Draw, analyze, construct, and troubleshoot registers and counters.
08.08 Draw, analyze, construct, and troubleshoot arithmetic circuits.

08.09 Draw, analyze, construct, and troubleshoot combinational logic circuits.
08.10 Draw, analyze, construct, and troubleshoot encoders and decoders.
08.11 Draw, analyze, construct, and troubleshoot multiplexers and demultiplexers.
08.12 Draw, analyze, construct, and troubleshoot memory circuits.
08.13 Draw, analyze, construct, and troubleshoot analog-to-digital and digital-to-analog circuits.
08.14 Draw, analyze, construct, and troubleshoot display circuits.
08.15 Set up and operate multimeters for digital circuits.
08.16 Set up and operate logic probes and pulsers for digital circuits.
08.17 Set up and operate oscilloscopes for digital circuits.
08.18 Set up and operate logic/data analyzers for digital circuits.

09.0 DEMONSTRATE PROFICIENCY IN MICROPROCESSORS THROUGH PROBLEM SOLVING USE OF CIRCUIT DIAGRMS AND SCEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF APPROPRIATE TOOLS AND TEST EQUIPMENT, AND TROUBLESHOOTING PROCEDURES — The student will be able to:

09.01 Analyze architecture of a Microprocessor Unit (MPU).
09.02 Analyze function of a MPU.
09.03 Analyze theory and operation of a MPU.
09.04 Analyze instruction set of a MPU.
09.05 Operate MPU system.
09.06 Write, debug, and execute program using MPU instruction set.
09.07 Apply input/output (I/O) techniques.
09.08 Analyze MPU system hardware.
09.09 Troubleshoot MPU system hardware.
09.10 Draw and analyze MPU system interface circuits.
09.11 Construct and troubleshoot MPU system interface circuits.
09.12 Set up and operate DVM for MPU system measurements.
09.13 Set up and operate logic probes for MPU system measurements. (TTL-CMOS compatible; memory; 10MHZ).
09.14 Set up and operate pulser probes for MPU system measurements.
09.15 Set up and operate oscilloscopes for MPU system measurements. (Minimum 60MPZ).
09.16 Set up and operate logic/data analyzers for MPU system measurements. (Minimum 16 channels).
09.17 Set up and operate pulse generators for MPU system measurements.
09.18 Set up and operate frequency counters for MPU system measurements. (0-200MHZ).

10.0 DEMONSTRATE PROFICIENCY IN PREPARING TECHNICAL RECORDS AND REPORTS — The student will be able to:

10.01 Draw and interpret electrical, electronic, and mechanical schematics.
10.02 Record data and design curves and graphs.
10.03 Write reports.
10.04 Maintain test logs.
10.05 Make equipment failure reports.
10.06 Specify and requistion simple electronic components.
10.07 Compose technical letters.
10.08 Write formal reports of laboratory experiences.

11.0 DEMONSTRATE PROFICIENCY IN MECHANICS/MICROMECHANICS THROUGH KNOWLEDGE OF MATERIALS (METALS AND COMPOSITE) SPECIFICATIONS AND MECHANICAL AND MICROMECHANICAL SYSTEMS USING BLUEPRINTS, MANUFACTURER'S SPECIFICATIONS, TOOLS, TEST EQUIPMENT AND TROUBLESHOOTING PROCEDURES — The student will be able to:

11.01 Analyze, troubleshoot, repair, and align power transmission components (gears, belts, chains, couplings, clutches, screw systems).
11.02 Analyze, troubleshoot, repair, bearings.
11.03 Apply lubrication specifications to mechanical systems.
11.04 Analyze, troubleshoot, repair, and align linkages and levers.
11.05 Analyze, troubleshoot, repair, and align cams.
11.06 Analyze, troubleshoot, repair, and repair materials to statics and material specifications.
11.07 Analyze, troubleshoot, repair metals to heat treating specifications.
11.08 Clean components and systems.

12.0 DEMONSTRATE PROFICIENCY IN SENSOR AND FEEDBACK DEVICES THROUGH KNOWLEDGE OF TRANSDUCERS, MOTOR CONTROLS, SYNCHROS AND RESOLVERS, PATTERN RECOGNITION SYSTEMS, PULSE ENCODERS, AND FARRAND SCALES USING EDNGINEERING SPECIFICATIONS, TOOLS, TEST EQUIPMENT AND TROUBLESHOOTING PROCEDURES — The student will be able to:

12.01 Analyze, troubleshoot, and align tranducers.

12.02 Analyze, troubleshoot, repair, and align motor controls.
12.03 Analyze, troubleshoot, and align synchros and resolvers.
12.04 Analyze, troubleshoot, and align pulse encoders.
12.05 Analyze, troubleshoot, and align farrand scales.

13.0 DEMONSTRATE PROFICIENCY IN HYDRAULIC VACUUM SYSTEMS THROUGH KNOWLEDGE OF PUMPS, CONTROL AND METERING DEVICES; ELECTROMECHANICAL VALVES AND VALVE, LINEAR AND ROTARY ACTUATORS; PRESSURE AND FLOW REGULATORS; HYDRAULIC, PNEUMATIC AND VACUUM DEVICES AND PIPING; RESERVOIRS AND FITTINGS — The student will be able to:

13.01 Clean components and systems.
13.02 Analyze, troubleshoot, and align pumps (positive and negative pressures).
13.03 Analyze, troubleshoot, and repair control and metering devices.
13.04 Analyze, troubleshoot, and repair electromechanical valves (directional and control).
13.05 Analyze, troubleshoot, and repair valve actuators (solenoid, servo, flow-control).
13.06 Analyze, troubleshoot, and repair linear and rotary actuators.
13.07 Analyze, troubleshoot, and repair pressure and flow regulators.
13.08 Analyze, troubleshoot, and repair hydraulic and penumatic circuits and systems.
13.09 Analyze, troubleshoot, and repair piping reservoirs and fittings.

14.0 DEMONSTRATE PROFICIENCY IN THE APPLICATION OF FEEDBACK SYSTEMS THROUGH KNOWLEDGE OF EXTERNAL FEEDBACK, HIERARCHICAL CONTROL TECHNIQUES, ROBOTIC INTERFACING AND RELATED ROBOTIC FEEDING EQUIPMENT — The student will be able to:

14.01 Analyze, troubleshooting, and repair external feedback.
14.02 Apply hierarchical control techniques to troubleshoot systems.
14.03 Analyze, troubleshoot, and repair interface of robot with peripheral equipment.
14.04 Analyze, troubleshoot, and repair robotics related feeding equipment.

15.0 DEMONSTRATE PROFICIENCY IN PRE-OPERATIONAL PROCEDURES OF ROBOTICS SYSTEMS USING ENGINEERING SPECIFICATIONS, BLUEPRINTS, CHECKLISTS — The student will be able to:

15.01 Perform pre-installation checklist.
15.02 Position and secure the robot arm and base.
15.03 Position the controller and peripherals.
15.04 Mount the end effectors.
15.05 Connect the components.
15.06 Connect the external input signals.
15.07 Connect the external output signals.
15.08 Apply safety regulations and procedures properly.

16.0 DEMONSTRATE PROFICIENCY IN OPERATIONAL PROCEDURES OF ROBOTIC SYSTEMS USING ENGINEERING SPECIFICATIONS, SYSTEMS PARAMETERS AND CHECKLISTS — The student will be able to:

16.01 Isolate and identify operating characteristics of robots.
16.02 Power up the system.
16.03 Perform calibration procedures.
16.04 Power down the system.
16.05 Check manual controls.
16.06 Perform operational checks on all joints and movements.
16.07 Operate terminals.
16.08 Operate terminals.
16.09 Set manual controls.
16.10 Store using memory systems.
16.11 Write simple programs.
16.12 Enter and edit programs.

17.0 DEMONSTRATE PROFICIENCY IN POST-OPERATIONAL PROCEDURES OF ROBOTIC SYSTEMS USING ENGINEERING SPECIFICATIONS, SYSTEM PARAMETERS, SYSTEM DIAGNOSTICS, TOOLS AND EQUIPMENT — The student will be able to:

17.01 Run diagnostic programs.
17.02 Calibrate, analyze, troubleshoot, and repair end effecgtors.
17.03 Calibrate, analyze, troubleshoot, and repair linkages and joints.
17.04 Calibrate, analyze, troubleshoot, and repair actuators (hydraulic and pneumatic).
17.05 Calibrate, analyze, troubleshoot, and repair motors (servo).
17.06 Calibrate, analyze, troubleshoot, and repair controllers.
17.07 Calibrate, analyze, troubleshoot, and repair digital controllers.
17.08 Calibrate, analyze, troubleshoot, and repair analog controllers.

17.09 Calibrate, analyze, troubleshoot, and repair feedback systems.
17.10 Calibrate, analyze, troubleshoot, and repair encoders.
17.11 Calibrater, analyze, troubleshoot, and repair resolvers, potentiometers.
17.12 Calibrate, analyze, troubleshoot, and repair tachometers and limit switchers.
17.13 Calibrate, analyze, troubleshoot, and repair input devices.
17.14 Calibrate, analyze, troubleshoot, and repair memory storage devices.
17.15 Calibrate, analyze, troubleshoot, and repair sequencing devices.
17.16 Calibrate, analyze, troubleshoot, and repair micro processor control systems.
17.17 Calibrate, analyze, troubleshoot, and repair micro computer control systems.
17.18 Calibrate, analyze, troubleshoot, and repair interface systems.
17.19 Calibrate, analyze, troubleshoot, and repair power supplies.
17.20 Calibrate, analyze, troubleshoot, and repair hydraulic power supplies.
17.21 Calibrate, analyze, troubleshoot, and repair pneumatic power supplies.
17.22 Calibrate, analyze, troubleshoot, and repair fluidic sequencing systems.
17.23 Troubleshoot power amplifiers.
17.24 Troubleshoot servo boards.
17.25 Troubleshoot servo motors.
17.26 Troubleshoot cables.
17.27 Troubleshoot wiring harness.
17.28 Troubleshoot switch settings.
17.29 Troubleshoot initialization message.
17.30 Troubleshoot interface boards.
17.31 Troubleshoot memory boards.
17.32 Troubleshoot clock terminators.
17.33 Troubleshoot clock encoders.
17.34 Troubleshoot clock brakes.
17.35 Troubleshoot clock air circuits.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS — The student will be able to:

18.01 List sources of job openings other than public or private employment agencies.
18.02 Write a letter of application for a job.
18.03 Prepare a vita, resume or personal fact sheet.
18.04 List factors to consider when applying for a job.
18.05 List ways of making contact with employers.
18.06 Identify documents which may be required when applying for a job inview.
18.07 Complete a job application form correctly.
18.08 Identify appropriate dress and grooming for job interview.
18.09 Classify behaviors considered appropriate or inappropriate in a job interview situation.
18.10 Describe advantages to employer and employees of being a productive worker.
18.11 Explain the purpose of supervision, self discipline and performance evaluation.
18.12 Identify appropriate response (s) to criticism from employer supervisor or other employees.
18.13 List consequences of being absent frequently from the job.
18.14 List consequences of frequently arriving late for work.
18.15 List factors to consider when resigning from a job.
18.16 Write a letter of resignation.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Electronic Chassis Assembly

CODE NUMBER: Secondary ______ Postsecondary EET0600

Florida CIP IN47.019903

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-15

CERTIFICATION COVERAGE: TEC ELEC @ 7 RADIO TV @ 7
ELECTRONIC 7 RADIO COMM@ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as electronic chassis assemblers (726.384-010), electronic wirers (726.687-010), encapsulators (726.684-030), solderers, or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, blueprint reading, selection and use of tools/materials, wire preparation for soldering, soldering skills, types of circuit boards, types of terminals, types of solder cups, component assembly, and solderless connections.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in electronic chassis assembly. The tools, materials and processes used in the laboratory should be similar to those used in industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 100 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Interpret written, graphic and/or oral instruction.
02. Develop basic electronic assembly skills.
03. Prepare wire for soldering and/or assembly.
04. Apply soldering techniques.
05. Connect component and lead wires.
06. Install electronic component assembly.
07. Prepare material for solderless connections.
08. Demonstrate employability skills.
09. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________
PROGRAM TITLE: Electronic Chassis Assembly POSTSECONDARY NUMBER: EET0600

01.0 INTERPRET WRITTEN, GRAPHIC AND/OR ORAL INSTRUCTION--The student will be able to:

01.01 Read and interpret written and oral instructions.
01.02 Read and interpret graphic instructions.
01.03 Follow accepted safety rules.
01.04 Read and interpret electronic chassis assembly.
01.05 Read and interpret color coding.

02.0 DEVELOP BASIC ELECTRONIC ASSEMBLY SKILLS--The student will be able to:

02.01 Use hand tools.
02.02 Use mechanical and other strippers.
02.03 Use soldering irons.
02.04 Select soldering materials.
02.05 Select types of wire.
02.06 Identify and select electronic component parts.
02.07 Select types of terminals.
02.08 Select types of cleaning tools and materials.
02.09 Use desoldering tools.

03.0 PREPARE WIRE FOR SOLDERING AND/OR ASSEMBLY--The student will be able to:

03.01 Strip wires for soldering.
03.02 Tin by hand and/or solder pot.

04.0 APPLY SOLDERING TECHNIQUES--The student will be able to:

04.01 Apply heat applications.
04.02 Apply solder applications.
04.03 Rework unsatisfactory connectors.
04.04 Maintain solder connection appearance.

05.0 CONNECT COMPONENT AND LEAD WIRES--The student will be able to:

05.01 Solder component leads to printed circuit boards.
05.02 Solder component lead wires to turret terminals.
05.03 Solder lead wires to bifurcated terminals.
05.04 Solder lead wires to hook and perfurated terminals.
05.05 Solder lead wires into connector solder cups.

06.0 INSTALL ELECTRONIC COMPONENT ASSEMBLY--The student will be able to:

06.01 Mount components onto a chassis.
06.02 Mount components onto a panel.
06.03 Mount components onto a circuit board.

07.0 PREPARE MATERIALS FOR SOLDERLESS CONNECTIONS--The student will be able to:

07.01 Prepare wire for cables.
07.02 Strip, terminalize, lay and lace harness.
07.03 Use heat shrinkable tubing.
07.04 Strip wires for wrapping.
07.05 Route and wrap for pin connections.

08.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

08.01 Conduct a job search.
08.02 Secure information about a job.
08.03 Identify documents which may be required when applying for a job interview.
08.04 Complete a job application form correctly.
08.05 Demonstrate competence in job interview techniques.
08.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
08.07 Identify acceptable work habits.
08.08 Demonstrate knowledge of how to make job changes appropriately.
08.09 Demonstrate acceptable employee health habits.

09.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

09.01 Define entrepreneurship.
09.02 Describe the importance of entrepreneurship to the American economy.
09.03 List the advantages and disadvantages of business ownership.
09.04 Identify the risks involved in ownership of a business.
09.05 Identify the necessary personal characteristics of a successful entrepreneur.
09.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Electronic Technology

CODE NUMBER: Secondary ________ Postsecondary EET0001

Florida CIP IN15.030300

SECONDARY SCHOOL CREDITS ____ COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVELS(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 13-15

CERTIFICATION COVERAGE: ELECTRONIC 7 TEC ELEC @ 7

I. MAJOR CONCEPTS/CONTENT: The program is designed to prepare individuals for employment as electronics technicians, any industry (003.161-014), electronics technicians, industrial (003.161-014), electronics technicians field service engineer, engineering assistant (003.161-014), or in related occupations in electronics.

This program includes all the competencies applicable to the secondary program of the common core of electronics, as well as some additional electronics competencies. This program does not address the skills appropriate to industrial plant maintenance. Industrial plant maintenance competencies are identified in the Industrial Electricity, Electromechanical Technology, and Industrial Machinery Maintenance and Repair programs. This program prepares individuals to assemble, install, operate, maintain, troubleshoot, and repair electrical/electronic equipment used in industry.

Graduates of this program will be prepared to enter advanced postsecondary training and education in specialized electronics-related fields. They may also be employed as trainees in various electronics-related positions in certain industries.

The content includes, but is not limited to, DC circuits, AC circuits, solid-state devices, analog circuits, digital devices, and microprocessors. Integrated into this content will be communications skills, leadership skills, human relations skills, employability skills, safe and efficient work practices, use of circuit diagrams and schematics, soldering and chassis assembly techniques, laboratory practices, and technical recording and reporting.

II. LABORATORY ACTIVITIES: Electronic laboratory activities are an integral part of this program. The tools, test equipment, materials, and processes used in this laboratory are similar to those used in industry. Students should be able to use the various types of precision test equipment found in general use throughout the electronics industry for the purpose of analyzing, troubleshooting, and repairing electronic circuitry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communications, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this program.

Instruction in microcomputer familiarization is appropriate for inclusion in this program. Instruction in entrepreneurship is also appropriate for inclusion in this program.

Algebra is recommended as a prerequisite for entry into this program.

The common core of electronics competencies are identified with the designation (CE).

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 12.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 contact hours (2160 clock hours).

IV. INTENDED OUTCOMES: After sucessfully completing this program, the individual will be able to:

01. Demonstrate proficiency in laboratory practices.
02. Demonstrate proficiency in DC circuits.
03. Demonstrate proficiency in AC circuits.
04. Demonstrate proficiency in solid-state devices.
05. Demonstrate proficiency in analog circuits.
06. Demonstrate proficiency in digital devices.
07. Demonstrate proficiency in microprocessing.
08. Demonstrate proficiency in technical recording and reporting.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ____________

PROGRAM TITLE: Electronic Technology POSTSECONDARY NUMBER: EET0001

This program includes all the competencies applicable to the secondary program of the common core of electronics, as well as some additional electronics competencies.

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES--The student will be able to:

01.01 Apply proper OSHA safety standards (CE).
01.02 Make electrical connections (CE).
01.03 Identify and use hand tools properly (CE).
01.04 Identify and use power tools properly (CE).
01.05 Demonstrate acceptable soldering and desoldering techniques (CE).

02.0 DEMONSTRATE PROFICIENCY IN DC CIRCUITS--The student will be able to:

02.01 Solve algebraic problems to include exponentials (prerequisite to DC) (CE).
02.02 Relate electricity to the nature of matter (CE).
02.03 Identify sources of electricity (CE).
02.04 Define voltage, current, resistance, power, and energy (CE).
02.05 Apply and relate Ohm's law (CE).
02.06 Read and interpret color codes and symbols to identify electrical components and values (CE).
02.07 Measure properties of a circuit using VOM and DVM meters (CE).
02.08 Compute and measure conductance and resistance of conductors and insulators (CE).
02.09 Apply Ohm's law to series circuits (CE).
02.10 Construct and verify operation of series circuits (CE).
02.11 Troubleshoot series circuits (CE).
02.12 Apply Ohm's law to parallel circuits (CE).
02.13 Construct and verify the operation of parallel circuits (CE).
02.14 Troubleshoot parallel circuits (CE).
02.15 Apply Ohm's law to series-parallel circuits (CE).
02.16 Construct and verify the operation of series-parallel circuits (CE).
02.17 Troubleshoot series-parallel circuits (CE).
02.18 Identify and define voltage divider circuits (loaded and unloaded) (CE).
02.19 Construct and verify the operation of voltage divider circuits (loaded and unloaded) (CE).
02.20 Troubleshoot voltage divider circuits (loaded and unloaded) (CE).
02.21 Apply maximum power theory (CE).
02.22 Construct and verify the operation of DC circuits that demonstrate the maximum power transfer theory (CE).
02.23 Define magnetic properties of circuits and devices (CE).
02.24 Determine the physical and electrical characteristics of capacitors and inductors (CE).
02.25 Define RC and RL time constants and classify the output of differentiators and integrators (CE).
02.26 Construct and verify the operation of differentiators and integrators to determine RC and RL time constants (CE).
02.27 Troubleshoot differentiator and integrator circuits (CE).
02.28 Set up and operate a VOM for DC circuits (CE).
02.29 Set up and operate a DVM for DC circuits (CE).
02.30 Set up and operate power supplies for DC circuits (CE).
02.31 Set up and operate oscilloscopes for DC circuits (CE).

03.0 DEMONSTRATE PROFICIENCY IN AC CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electronics (prerequisite to AC) (CE).
03.02 Identify properties of an AC signal (CE).
03.03 Identify AC sources (CE).
03.04 Analyze and measure AC signals using oscilloscope, frequency meter, and generator (CE).
03.05 Define the characteristics of AC capacitive circuits (CE).
03.06 Construct and verify the operation of AC capacitive circuits (CE).
03.07 Troubleshoot AC capacitive circuits (CE).

03.08 Define the characteristics of AC inductive circuits (CE).
03.09 Construct and verify the operation of AC inductive circuits (CE).
03.10 Troubleshoot AC inductive circuits (CE).
03.11 Define and apply the principles of transformers to AC circuits (CE).
03.12 Construct and verify the operation of AC circuits utilizing transformers (CE).
03.13 Troubleshoot AC circuits utilizing transformers (CE).
03.14 Define the characteristics of RLC circuits (series, parallel, and complex) (CE).
03.15 Construct and verify the operation of RLC circuits (series, parallel, and complex) (CE).
03.16 Define the characteristics of series and parallel resonant circuits (CE).
03.17 Construct and verify the operation of series and parallel resonant circuits (CE).
03.18 Define the characteristics of filter circuits (CE).
03.19 Construct and verify the operation of filter circuits (CE).
03.20 Troubleshoot filter circuits (CE).
03.21 Define the characteristics of polyphase circuits (CE).
03.22 Define basic motor theory and operation (CE).
03.23 Define basic generator theory and operation (CE).
03.24 Set up and operate a VOM for AC circuits (CE).
03.25 Set up and operate a DVM for AC circuits (CE).
03.26 Set up and operate power supplies for AC circuits (CE).
03.27 Set up and operate oscilloscopes for AC circuits (CE).
03.28 Set up and operate frequency counters for AC circuits (CE).
03.29 Set up and operate signal generators for AC circuits (CE).
03.30 Set up and operate capacitor/inductor analyzers for AC circuits (CE).
03.31 Set up and operate impedance bridges for AC circuits (CE).

04.0 DEMONSTRATE PROFICIENCY IN SOLID-STATE DEVICES--The student will be able to:

04.01 Identify properties of semiconductor materials (CE).
04.02 Identify and define operating characteristics and applications of pn junction diodes (CE).
04.03 Identify and define operating characteristics and applications of special diodes (CE).
04.04 Analyze diode circuits (CE).
04.05 Construct diode circuits (CE).
04.06 Troubleshoot diode circuits (CE).
04.07 Identify and define operating characteristics and applications of bipolar transistors (CE).
04.08 Identify and define operating characteristics and applications of field effect transistors (FET's) (CE).
04.09 Identify and define operating characteristics and applications of thyristors (CE).
04.10 Identify and define operating characteristics and applications of integrated circuits (CE).
04.11 Set up and operate a VOM for solid-state devices (CE).
04.12 Set up and operate a DVM for solid-state devices (CE).
04.13 Set up and operate power supplies for solid-state devices (CE).
04.14 Set up and operate oscilloscopes for solid-state devices (CE).
04.15 Set up and operate frequency counters for solid-state devices (CE).
04.16 Set up and operate signal generators for solid-state devices (CE).
04.17 Set up and operate capacitor/inductor analyzers for solid-state devices (CE).
04.18 Set up and operate impedance bridges for solid-state devices (CE).
04.19 Set up and operate curve tracers (CE).
04.20 Set up and operate transistor testers (CE).

05.0 DEMONSTRATE PROFICIENCY IN ANALOG CIRCUITS--The student will be able to:

05.01 Identify and define operating characteristics and applications of single-stage amplifiers (CE).
05.02 Construct single-stage amplifiers (CE).
05.03 Troubleshoot single-stage amplifiers (CE).
05.04 Identify and define operational characteristics and applications of multistage amplifiers (CE).

05.05 Construct multistage amplifiers (CE).
05.06 Troubleshoot multistage amplifiers (CE).
05.07 Identify and define operating characteristics and applications of basic power supplies and filters (CE).
05.08 Construct basic power supplies and filters (CE).
05.09 Troubleshoot basic power supplies and filters (CE).
05.10 Identify and define operating characteristics and applications of differential and operational amplifiers (CE).
05.11 Construct differential and operational amplifiers (CE).
05.12 Troubleshoot differential and operational amplifiers (CE).
05.13 Identify and define operating characteristics and applications of power supply regulators (CE).
05.14 Construct power supply regulators (CE).
05.15 Troubleshoot power supply regulators (CE).
05.16 Identify and define operating characteristics and applications of active filters (CE).
05.17 Construct active filters (CE).
05.18 Troubleshoot active filters (CE).
05.19 Identify and define operating characteristics and applications of sinusoidal and non-sinusoidal oscillators (CE).
05.20 Construct oscillators (optional in high school and vocational center programs) (CE).
05.21 Troubleshoot oscillators (optional in high school and vocational center programs) (CE).
05.22 Identify and define operating characteristics and applications of motor phase-control circuits (single-phase and multiphase) (CE).
05.23 Identify and define operating characteristics and applications of cathode ray tubes (CRT's) as used in video terminals (CE).
05.24 Identify and define operating characteristics and applications of optical devices (CE).
05.25 Set up and operate a VOM for analog circuits (CE).
05.26 Set up and operate a DVM for analog circuits (CE).
05.27 Set up and operate power supplies for analog circuits (CE).
05.28 Set up and operate oscilloscopes for analog circuits (CE).
05.29 Set up and operate frequency counters for analog circuits (CE).
05.30 Set up and operate signal generators for analog circuits (CE).
05.31 Set up and operate impedance bridges for analog circuits (CE).

06.0 DEMONSTRATE PROFICIENCY IN DIGITAL DEVICES--The student will be able to:

06.01 Define and apply numbering systems (hex., bin., and oct.) to codes and arithmetic (CE).
06.02 Analyze/minimize logic circuits using Boolean operations (CE).
06.03 Set up and operate a VOM for digital devices (CE).
06.04 Set up and operate a DVM for digital devices (CE).
06.05 Set up and operate logic probes for digital devices (CE).
06.06 Set up and operate power supplies for digital devices and solve power distribution and noise problems (CE).
06.07 Set up and operate pulsers for digital devices (CE).
06.08 Set up and operate oscilloscopes for digital devices (CE).
06.09 Set up and operate logic analyzers for digital devices (CE).
06.10 Set up and operate pulse generators for digital devices (CE).
06.11 Set up and operate counters for digital devices (CE).
06.12 Identify types of logic gates and their truth tables (CE).
06.13 Construct logic gates using discrete components (CE).
06.14 Troubleshoot logic gates (CE).
06.15 Analyze types of flip-flops and their truth and excitation tables (CE).
06.16 Construct flip-flops using discrete components (CE).
06.17 Troubleshoot flip-flops (CE).
06.18 Identify, define, and measure characteristics of integrated circuit IC logic families (CE).
06.19 Identify types of registers and counters (CE).
06.20 Construct registers and counters using flip-flops and logic gates (CE).
06.21 Troubleshoot registers and counters (CE).
06.22 Analyze clock and timing circuits (CE).
06.23 Construct clock and timing circuits (CE).
06.24 Troubleshoot clock and timing circuits (CE).
06.25 Identify and relate types of logic-arithmetic circuits (CE).
06.26 Construct logic-arithmetic circuits (CE).
06.27 Troubleshoot logic-arithmetic circuits (CE).

06.28 Identify types of encoding and decoding devices (CE).
06.29 Construct encoders and decoders (CE).
06.30 Troubleshoot encoders and decoders (CE).
06.31 Identify types of multiplexer and demultiplexer circuits (CE).
06.32 Construct multiplexer and demultiplexer circuits (CE).
06.33 Troubleshoot multiplexer and demultiplexer circuits (CE).
06.34 Identify types of memory circuits (static, dynamic, volatile, nonvolatile, etc.) (CE).
06.35 Use memory devices in circuits (CE).
06.36 Troubleshoot memory-device circuits (CE).
06.37 Relate the uses of digital-to-analog and analog-to-digital conversions (CE).
06.38 Construct digital-to-analog and analog-to-digital circuits (CE).
06.39 Troubleshoot digital-to-analog and analog-to-digital circuits (CE).
06.40 Identify types of displays (LED, LCD, etc.) (CE).
06.41 Construct display circuits (CE).
06.42 Troubleshoot display circuits (CE).
06.43 Analyze representative digital systems appropriate to class projects designed for local industrial applications.
06.44 Design, construct, and troubleshoot representative digital systems appropriate to class projects designed for local industrial applications.
06.45 Demonstrate applications of representative digital systems appropriate to class projects designed for local industrial applications.

07.0 DEMONSTRATE PROFICIENCY IN MICROPROCESSING--The student will be able to:

07.01 Identify CPU (Architecture) building blocks and their uses (CE).
07.02 Analyze BUS concepts (CE).
07.03 Analyze various memory schemes (CE).
07.04 Set up and operate a VOM for microprocessing analysis (CE).
07.05 Set up and operate a DVM for microprocessing analysis (CE).
07.06 Set up and operate power supplies for microprocessor use (CE).
07.07 Set up and operate oscilloscopes for microprocessors (CE).
07.08 Set up and operate logic/data analyzers for microprocessor de-bug (CE).
07.09 Identify types of input and output devices and peripherals (PIA's, UART's, etc.) (CE).
07.10 Interface input and output ports (RS-232, RS-422, etc.) (CE).
07.11 Troubleshoot input and output ports (CE).
07.12 Execute computer instruction sets (CE).
07.13 Design and lay out a unique microprocessing system.
07.14 Construct a unique microprocessing application system.
07.15 Troubleshoot and demonstrate proficiency in a unique application in microprocessor systems.
07.16 Construct and troubleshoot a single-chip microprocessor system.
07.17 Construct and troubleshoot an advanced microcomputer syst

08.0 DEMONSTRATE PROFICIENCY IN TECHNICAL RECORDING AND REPORTING--The student will be able to:

08.01 Draw and interpret electronic schematics (CE).
08.02 Record data and design curves and graphs (CE).
08.03 Write reports and make oral presentations (CE).
08.04 Maintain test logs (CE).
08.05 Make equipment-failure reports (CE).
08.06 Specify and requisition simple electronic components (CE).
08.07 Compose technical letters and memoranda (CE).
08.08 Write formal reports of laboratory experiences (CE).
08.09 Draft preventive maintenance and calibration procedures (CE).

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents that may be required when applying for a job.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.

09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Electronics

CODE NUMBER: Secondary 8730000 Postsecondary _______

Florida CIP IN47.012500

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS _____ POSTSECONDARY ADULT VOCATIONAL CREDITS _______
(150 hours instruction per credit, SB923, Section I)

APPLICABLE LEVEL(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 10-12, 21

CERTIFICATION COVERAGE: TEC ELEC @ 7 ELECTRONIC 7 RADIO TV @ 7

I. MAJOR CONCEPTS/CONTENT: The program is designed to prepare individuals for employment as electronics technicians, any industry (003.161-014), electronics technicians, industrial (003.161-014), electronics technicians, field service engineer, engineering assistant (003.161-014), or in related occupations in electronics.

This program is the Florida standard common core of electronic competencies. The program prepares individuals to assemble, install, operate, maintain, troubleshoot, and repair electrical/electronic equipment used in industry.

Graduates of this program will be prepared to enter advanced postsecondary training and education in specialized electronics-related fields. They may also be employed as trainees in various electronics-related positions in certain industries.

The content includes, but is not limited to, DC circuits, AC circuits, solid-state devices, analog circuits, digital devices, and microprocessors. Integrated into this content will be communications skills, leadership skills, human relations skills, employability skills, safe and efficient work practices, use of circuit diagrams and schematics, soldering and chassis assembly techniques, laboratory practices, and technical recording and reporting.

Listed below are the courses that comprise this program when offered at the secondary level:

8730010	Electronics 1
8730020	Electronics 2
8730030	Electronics 3
8730040	Electronics 4
8730050	Electronics 5
8730060	Electronics 6

II. LABORATORY ACTIVITIES: Electronic laboratory activities are an integral part of this program. The tools, test equipment, materials, and processes used in this laboratory are similar to those used in industry. Students should be able to use the various types of precision test equipment found in general use throughout the electronics industry for the purpose of analyzing, troubleshooting, and repairing electronic circuitry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communications, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

Instruction in microcomputer familiarization is appropriate for inclusion in this program. Instruction in entrepreneurship is also appropriate for inclusion in this program.

Algebra is recommended as a prerequisite for entry into this program.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After sucessfully completing this program, the individual will be able to:

01. Demonstrate proficiency in laboratory practices.
02. Demonstrate proficiency in DC circuits.
03. Demonstrate proficiency in AC circuits.
04. Demonstrate proficiency in solid-state devices.
05. Demonstrate proficiency in analog circuits.
06. Demonstrate proficiency in digital devices.
07. Demonstrate proficiency in microprocessing.
08. Demonstrate proficiency in technical recording and reporting.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8730000

PROGRAM TITLE: Electronics POSTSECONDARY NUMBER: ______

This course is the Florida standard common core of electronics competencies.

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for developing proficiency in laboratory practices and in DC circuits.

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES--The student will be able to:

- 01.01 Apply proper OSHA safety standards (CE).
- 01.02 Make electrical connections (CE).
- 01.03 Identify and use hand tools properly (CE).
- 01.04 Identify and use power tools properly (CE).
- 01.05 Demonstrate acceptable soldering and desoldering techniques (CE).

02.0 DEMONSTRATE PROFICIENCY IN DC CIRCUITS--The student will be able to:

- 02.01 Solve algebraic problems to include exponentials (prerequisite to DC) (CE).
- 02.02 Relate electricity to the nature of matter (CE).
- 02.03 Identify sources of electricity (CE).
- 02.04 Define voltage, current, resistance, power, and energy (CE).
- 02.05 Apply and relate Ohm's law (CE).
- 02.06 Read and interpret color codes and symbols to identify electrical components and values (CE).
- 02.07 Measure properties of a circuit using VOM and DVM meters (CE).
- 02.08 Compute and measure conductance and resistance of conductors and insulators (CE).
- 02.09 Apply Ohm's law to series circuits (CE).
- 02.10 Construct and verify operation of series circuits (CE).
- 02.11 Troubleshoot series circuits (CE).
- 02.12 Apply Ohm's law to parallel circuits (CE).
- 02.13 Construct and verify the operation of parallel circuits (CE).
- 02.14 Troubleshoot parallel circuits (CE).
- 02.15 Apply Ohm's law to series-parallel circuits (CE).
- 02.16 Construct and verify the operation of series-parallel circuits (CE).
- 02.17 Troubleshoot series-parallel circuits (CE).
- 02.18 Identify and define voltage divider circuits (loaded and unloaded) (CE).
- 02.19 Construct and verify the operation of voltage divider circuits (loaded and unloaded) (CE).
- 02.20 Troubleshoot voltage divider circuits (loaded and unloaded)
- 02.21 Apply maximum power theory (CE).
- 02.22 Construct and verify the operation of DC circuits that demonstrate the maximum power transfer theory (CE).
- 02.23 Define magnetic properties of circuits and devices (CE).
- 02.24 Determine the physical and electrical characteristics of capacitors and inductors (CE).
- 02.25 Define RC and RL time constants and classify the output of differentiators and integrators (CE).
- 02.26 Construct and verify the operation of differentiators and integrators to determine RC and RL time constants (CE).
- 02.27 Troubleshoot differentiator and integrator circuits (CE).
- 02.28 Set up and operate a VOM for DC circuits (CE).
- 02.29 Set up and operate a DVM for DC circuits (CE).
- 02.30 Set up and operate power supplies for DC circuits (CE).
- 02.31 Set up and operate oscilloscopes for DC circuits (CE).

03.0 DEMONSTRATE PROFICIENCY IN AC CIRCUITS--The student will be able to:

- 03.01 Solve basic trigonometric problems as applicable to electronics (prerequisite to AC) (CE).
- 03.02 Identify properties of an AC signal (CE).
- 03.03 Identify AC sources (CE).
- 03.04 Analyze and measure AC signals using oscilloscope, frequency meter, and generator (CE).
- 03.05 Define the characteristics of AC capacitive circuits (CE).
- 03.06 Construct and verify the operation of AC capacitive circuits (CE).

03.07 Troubleshoot AC capacitive circuits (CE).
03.08 Define the characteristics of AC inductive circuits (CE).
03.09 Construct and verify the operation of AC inductive circuits (CE).
03.10 Troubleshoot AC inductive circuits (CE).
03.11 Define and apply the principles of transformers to AC circuits (CE).
03.12 Construct and verify the operation of AC circuits utilizing transformers (CE).
03.13 Troubleshoot AC circuits utilizing transformers (CE).
03.14 Define the characteristics of RLC circuits (series, parallel, and complex) (CE).
03.15 Construct and verify the operation of RLC circuits (series, parallel, and complex) (CE).
03.16 Define the characteristics of series and parallel resonant circuits (CE).
03.17 Construct and verify the operation of series and parallel resonant circuits (CE).
03.18 Define the characteristics of filter circuits (CE).
03.19 Construct and verify the operation of filter circuits (CE).
03.20 Troubleshoot filter circuits (CE).
03.21 Define the characteristics of polyphase circuits (CE).
03.22 Define basic motor theory and operation (CE).
03.23 Define basic generator theory and operation (CE).
03.24 Set up and operate a VOM for AC circuits (CE).
03.25 Set up and operate a DVM for AC circuits (CE).
03.26 Set up and operate power supplies for AC circuits (CE).
03.27 Set up and operate oscilloscopes for AC circuits (CE).
03.28 Set up and operate frequency counters for AC circuits (CE).
03.29 Set up and operate signal generators for AC circuits (CE).
03.30 Set up and operate capacitor/inductor analyzers for AC circuits (CE).
03.31 Set up and operate impedance bridges for AC circuits (CE).

04.0 DEMONSTRATE PROFICIENCY IN SOLID-STATE DEVICES--The student will be able to:

04.01 Identify properties of semiconductor materials (CE).
04.02 Identify and define operating characteristics and applications of pn junction diodes (CE).
04.03 Identify and define operating characteristics and applications of special diodes (CE).
04.04 Analyze diode circuits (CE).
04.05 Construct diode circuits (CE).
04.06 Troubleshoot diode circuits (CE).
04.07 Identify and define operating characteristics and applications of bipolar transistors (CE).
04.08 Identify and define operating characteristics and applications of field effect transistors (FET's) (CE).
04.09 Identify and define operating characteristics and applications of thyristors (CE).
04.10 Identify and define operating characteristics and applications of integrated circuits (CE).
04.11 Set up and operate a VOM for solid-state devices (CE).
04.12 Set up and operate a DVM for solid-state devices (CE).
04.13 Set up and operate power supplies for solid-state devices (CE).
04.14 Set up and operate oscilloscopes for solid-state devices (CE).
04.15 Set up and operate frequency counters for solid-state devices (CE).
04.16 Set up and operate signal generators for solid-state devices (CE).
04.17 Set up and operate capacitor/inductor analyzers for solid-state devices (CE).
04.18 Set up and operate impedance bridges for solid-state devices (CE).
04.19 Set up and operate curve tracers (CE).
04.20 Set up and operate transistor testers (CE).

05.0 DEMONSTRATE PROFICIENCY IN ANALOG CIRCUITS--The student will be able to:

05.01 Identify and define operating characteristics and applications of single-stage amplifiers (CE).
05.02 Construct single-stage amplifiers (CE).
05.03 Troubleshoot single-stage amplifiers (CE).
05.04 Identify and define operational characteristics and applications of multistage amplifiers (CE).
05.05 Construct multistage amplifiers (CE).
05.06 Troubleshoot multistage amplifiers (CE).

05.07 Identify and define operating characteristics and applications of basic power supplies and filters (CE).
05.08 Construct basic power supplies and filters (CE).
05.09 Troubleshoot basic power supplies and filters (CE).
05.10 Identify and define operating characteristics and applications of differential and operational amplifiers (CE).
05.11 Construct differential and operational amplifiers (CE).
05.12 Troubleshoot differential and operational amplifiers (CE).
05.13 Identify and define operating characteristics and applications of power supply regulators (CE).
05.14 Construct power supply regulators (CE).
05.15 Troubleshoot power supply regulators (CE).
05.16 Identify and define operating characteristics and applications of active filters (CE).
05.17 Construct active filters (CE).
05.18 Troubleshoot active filters (CE).
05.19 Identify and define operating characteristics and applications of sinusoidal and non-sinusoidal oscillators (CE).
05.20 Construct oscillators (optional in high school and vocational center programs) (CE).
05.21 Troubleshoot oscillators (optional in high school and vocational center programs) (CE).
05.22 Identify and define operating characteristics and applications of motor phase-control circuits (single-phase and multiphase) (CE).
05.23 Identify and define operating characteristics and applications of cathode ray tubes (CRT's) as used in video terminals (CE).
05.24 Identify and define operating characteristics and applications of optical devices (CE).
05.25 Set up and operate a VOM for analog circuits (CE).
05.26 Set up and operate a DVM for analog circuits (CE).
05.27 Set up and operate power supplies for analog circuits (CE).
05.28 Set up and operate oscilloscopes for analog circuits (CE).
05.29 Set up and operate frequency counters for analog circuits (CE).
05.30 Set up and operate signal generators for analog circuits (CE).
05.31 Set up and operate impedance bridges for analog circuits (CE).

06.0 DEMONSTRATE PROFICIENCY IN DIGITAL DEVICES--The student will be able to:

06.01 Define and apply numbering systems (hex., bin., and oct.) to codes and arithmetic (CE).
06.02 Analyze/minimize logic circuits using Boolean operations (CE).
06.03 Set up and operate a VOM for digital devices (CE).
06.04 Set up and operate a DVM for digital devices (CE).
06.05 Set up and operate logic probes for digital devices (CE).
06.06 Set up and operate power supplies for digital devices and solve power distribution and noise problems (CE).
06.07 Set up and operate pulsers for digital devices (CE).
06.08 Set up and operate oscilloscopes for digital devices (CE).
06.09 Set up and operate logic analyzers for digital devices (CE).
06.10 Set up and operate pulse generators for digital devices (CE).
06.11 Set up and operate counters for digital devices (CE).
06.12 Identify types of logic gates and their truth tables (CE).
06.13 Construct logic gates using discrete components (CE).
06.14 Troubleshoot logic gates (CE).
06.15 Analyze types of flip-flops and their truth and excitation tables (CE).
06.16 Construct flip-flops using discrete components (CE).
06.17 Troubleshoot flip-flops (CE).
06.18 Identify, define, and measure characteristics of integrated circuit IC logic families (CE).
06.19 Identify types of registers and counters (CE).
06.20 Construct registers and counters using flip-flops and logic gates (CE).
06.21 Troubleshoot registers and counters (CE).
06.22 Analyze clock and timing circuits (CE).
06.23 Construct clock and timing circuits (CE).
06.24 Troubleshoot clock and timing circuits (CE).
06.25 Identify and relate types of logic-arithmetic circuits (CE).
06.26 Construct logic-arithmetic circuits (CE).
06.27 Troubleshoot logic-arithmetic circuits (CE).
06.28 Identify types of encoding and decoding devices (CE).
06.29 Construct encoders and decoders (CE).
06.30 Troubleshoot encoders and decoders (CE).

06.31 Identify types of multiplexer and demultiplexer circuits (CE).
06.32 Construct multiplexer and demultiplexer circuits (CE).
06.33 Troubleshoot multiplexer and demultiplexer circuits (CE).
06.34 Identify types of memory circuits (static, dynamic, volatile, nonvolatile, etc.) (CE).
06.35 Use memory devices in circuits (CE).
06.36 Troubleshoot memory-device circuits (CE).
06.37 Relate the uses of digital-to-analog and analog-to-digital conversions (CE).
06.38 Construct digital-to-analog and analog-to-digital circuits (CE).
06.39 Troubleshoot digital-to-analog and analog-to-digital circuits (CE).
06.40 Identify types of displays (LED, LCD, etc.) (CE).
06.41 Construct display circuits (CE).
06.42 Troubleshoot display circuits (CE).

07.0 DEMONSTRATE PROFICIENCY IN MICROPROCESSING--The student will be able to:

07.01 Identify CPU (Architecture) building blocks and their uses (CE).
07.02 Analyze BUS concepts (CE).
07.03 Analyze various memory schemes (CE).
07.04 Set up and operate a VOM for microprocessing analysis (CE).
07.05 Set up and operate a DVM for microprocessing analysis (CE).
07.06 Set up and operate power supplies for microprocessor use (CE).
07.07 Set up and operate oscilloscopes for microprocessors (CE).
07.08 Set up and operate logic/data analyzers for microprocessor de-bug (CE).
07.09 Identify types of input and output devices and peripherals (PIA's, UART's, etc.) (CE).
07.10 Interface input and output ports (RS-232, RS-422, etc.) (CE).
07.11 Troubleshoot input and output ports (CE).
07.12 Execute computer instruction sets (CE).

08.0 DEMONSTRATE PROFICIENCY IN TECHNICAL RECORDING AND REPORTING --The student will be able to:

08.01 Draw and interpret electronic schematics (CE).
08.02 Record data and design curves and graphs (CE).
08.03 Write reports and make oral presentations (CE).
08.04 Maintain test logs (CE).
08.05 Make equipment-failure reports (CE).
08.06 Specify and requisition simple electronic components (CE).
08.07 Compose technical letters and memoranda (CE).
08.08 Write formal reports of laboratory experiences (CE).
08.09 Draft preventive maintenance and calibration procedures (CE).

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents that may be required when applying for a job.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial — COURSE CREDIT: 1
PROGRAM TITLE: Electronics — PROGRAM NUMBER: 8730000
COURSE TITLE: Electronics 1 — COURSE NUMBER: 8730010

The six courses set forth here and on the following pages are the Florida standard common core of electronics competencies.

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for developing proficiency in laboratory practices and in DC circuits.

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES--The student will be able to:

01.01 Apply proper OSHA safety standards (CE).
01.02 Make electrical connections (CE).
01.03 Identify and use hand tools properly (CE).
01.04 Identify and use power tools properly (CE).
01.05 Demonstrate acceptable soldering and desoldering techniques (CE).

02.0 DEMONSTRATE PROFICIENCY IN DC CIRCUITS--The student will be able to:

02.01 Solve algebraic problems to include exponentials (prerequisite to DC) (CE).
02.02 Relate electricity to the nature of matter (CE).
02.03 Identify sources of electricity (CE).
02.04 Define voltage, current, resistance, power, and energy (CE).
02.05 Apply and relate Ohm's law (CE).
02.06 Read and interpret color codes and symbols to identify electrical components and values (CE).
02.07 Measure properties of a circuit using VOM and DVM meters (CE).
02.08 Compute and measure conductance and resistance of conductors and insulators (CE).
02.09 Apply Ohm's law to series circuits (CE).
02.10 Construct and verify operation of series circuits (CE).
02.11 Troubleshoot series circuits (CE).
02.12 Apply Ohm's law to parallel circuits (CE).
02.13 Construct and verify the operation of parallel circuits (CE).
02.14 Troubleshoot parallel circuits (CE).
02.15 Apply Ohm's law to series-parallel circuits (CE).
02.16 Construct and verify the operation of series-parallel circuits (CE).
02.17 Troubleshoot series-parallel circuits (CE).
02.18 Identify and define voltage divider circuits (loaded and unloaded) (CE).
02.19 Construct and verify the operation of voltage divider circuits (loaded and unloaded) (CE).
02.20 Troubleshoot voltage divider circuits (loaded and unloaded) (CE).
02.21 Apply maximum power theory (CE).
02.22 Construct and verify the operation of DC circuits that demonstrate the maximum power transfer theory (CE).
02.23 Define magnetic properties of circuits and devices (CE).
02.24 Determine the physical and electrical characteristics of capacitors and inductors (CE).
02.25 Define RC and RL time constants and classify the output of differentiators and integrators (CE).
02.26 Construct and verify the operation of differentiators and integrators to determine RC and RL time constants (CE).
02.27 Troubleshoot differentiator and integrator circuits (CE).
02.28 Set up and operate a VOM for DC circuits (CE).
02.29 Set up and operate a DVM for DC circuits (CE).
02.30 Set up and operate power supplies for DC circuits (CE).
02.31 Set up and operate oscilloscopes for DC circuits (CE).

STUDENT PERFORMANCE STANDARDS
PROGRAM AREA: Industrial
PROGRAM TITLE: Electronics
COURSE TITLE: Electronics 2

EFFECTIVE DATE: July, 1987
COURSE CREDIT: 1
PROGRAM NUMBER: 8730000
COURSE NUMBER: 8730020

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for developing proficiency in AC circuits.

03.0 DEMONSTRATE PROFICIENCY IN AC CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electronics (prerequisite to AC) (CE).
03.02 Identify properties of an AC signal (CE).
03.03 Identify AC sources (CE).
03.04 Analyze and measure AC signals using oscilloscope, frequency meter, and generator (CE).
03.05 Define the characteristics of AC capacitive circuits (CE).
03.06 Construct and verify the operation of AC capacitive circuits (CE).
03.07 Troubleshoot AC capacitive circuits (CE).
03.08 Define the characteristics of AC inductive circuits (CE).
03.09 Construct and verify the operation of AC inductive circuits (CE).
03.10 Troubleshoot AC inductive circuits (CE).
03.11 Define and apply the principles of transformers to AC circuits (CE).
03.12 Construct and verify the operation of AC circuits utilizing transformers (CE).
03.13 Troubleshoot AC circuits utilizing transformers (CE).
03.14 Define the characteristics of RLC circuits (series, parallel, and complex) (CE).
03.15 Construct and verify the operation of RLC circuits (series, parallel, and complex) (CE).
03.16 Define the characteristics of series and parallel resonant circuits (CE).
03.17 Construct and verify the operation of series and parallel resonant circuits (CE).
03.18 Define the characteristics of filter circuits (CE).
03.19 Construct and verify the operation of filter circuits (CE).
03.20 Troubleshoot filter circuits (CE).
03.21 Define the characteristics of polyphase circuits (CE).
03.22 Define basic motor theory and operation (CE).
03.23 Define basic generator theory and operation (CE).
03.24 Set up and operate a VOM for AC circuits (CE).
03.25 Set up and operate a DVM for AC circuits (CE).
03.26 Set up and operate power supplies for AC circuits (CE).
03.27 Set up and operate oscilloscopes for AC circuits (CE).
03.28 Set up and operate frequency counters for AC circuits (CE).
03.29 Set up and operate signal generators for AC circuits (CE).
03.30 Set up and operate capacitor/inductor analyzers for AC circuits (CE).
03.31 Set up and operate impedance bridges for AC circuits (CE).

STUDENT PERFORMANCE STANDARDS
PROGRAM AREA: Industrial
PROGRAM TITLE: Electronics
COURSE TITLE: Electronics 3

EFFECTIVE DATE: July, 1987
COURSE CREDIT: 1
PROGRAM NUMBER: 8730000
COURSE NUMBER: 8730030

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for developing proficiency in solid-state devices.

Electronics 3 - Continued

04.0 DEMONSTRATE PROFICIENCY IN SOLID-STATE DEVICES--The student will be able to:

04.01 Identify properties of semiconductor materials (CE).
04.02 Identify and define operating characteristics and applications of pn junction diodes (CE).
04.03 Identify and define operating characteristics and applications of special diodes (CE).
04.04 Analyze diode circuits (CE).
04.05 Construct diode circuits (CE).
04.06 Troubleshoot diode circuits (CE).
04.07 Identify and define operating characteristics and applications of bipolar transistors (CE).
04.08 Identify and define operating characteristics and applications of field effect transistors (FET's) (CE).
04.09 Identify and define operating characteristics and applications of thyristors (CE).
04.10 Identify and define operating characteristics and applications of integrated circuits (CE).
04.11 Set up and operate a VOM for solid-state devices (CE).
04.12 Set up and operate a DVM for solid-state devices (CE).
04.13 Set up and operate power supplies for solid-state devices (CE).
04.14 Set up and operate oscilloscopes for solid-state devices (CE).
04.15 Set up and operate frequency counters for solid-state devices (CE).
04.16 Set up and operate signal generators for solid-state devices (CE).
04.17 Set up and operate capacitor/inductor analyzers for solid-state devices (CE).
04.18 Set up and operate impedance bridges for solid-state devices (CE).
04.19 Set up and operate curve tracers (CE).
04.20 Set up and operate transistor testers (CE).

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Electronics PROGRAM NUMBER: 8730000

COURSE TITLE: Electronics 4 COURSE NUMBER: 8730040

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for developing proficiency in analog circuits.

05.0 DEMONSTRATE PROFICIENCY IN ANALOG CIRCUITS--The student will be able to:

05.01 Identify and define operating characteristics and applications of single-stage amplifiers (CE).
05.02 Construct single-stage amplifiers (CE).
05.03 Troubleshoot single-stage amplifiers (CE).
05.04 Identify and define operational characteristics and applications of multistage amplifiers (CE).
05.05 Construct multistage amplifiers (CE).
05.06 Troubleshoot multistage amplifiers (CE).
05.07 Identify and define operating characteristics and applications of basic power supplies and filters (CE).
05.08 Construct basic power supplies and filters (CE).
05.09 Troubleshoot basic power supplies and filters (CE).
05.10 Identify and define operating characteristics and applications o differential and operational amplifiers (CE).
05.11 Construct differential and operational amplifiers (CE).
05.12 Troubleshoot differential and operational amplifiers (CE).
05.13 Identify and define operating characteristics and applications of power supply regulators (CE).
05.14 Construct power supply regulators (CE).
05.15 Troubleshoot power supply regulators (CE).
05.16 Identify and define operating characteristics and applications of active filters (CE).

05.17 Construct active filters (CE).
05.18 Troubleshoot active filters (CE).
05.19 Identify and define operating characteristics and applications of sinusoidal and non-sinusoidal oscillators (CE).
05.20 Construct oscillators (optional in high school and vocational center programs) (CE).
05.21 Troubleshoot oscillators (optional in high school and vocational center programs) (CE).
05.22 Identify and define operating characteristics and applications of motor phase-control circuits (single-phase and multiphase) (CE).
05.23 Identify and define operating characteristics and applications of cathode ray tubes (CRT's) as used in video terminals (CE).
05.24 Identify and define operating characteristics and applications of optical devices (CE).
05.25 Set up and operate a VOM for analog circuits (CE).
05.26 Set up and operate a DVM for analog circuits (CE).
05.27 Set up and operate power supplies for analog circuits (CE).
05.28 Set up and operate oscilloscopes for analog circuits (CE).
05.29 Set up and operate frequency counters for analog circuits (CE).
05.30 Set up and operate signal generators for analog circuits (CE).
05.31 Set up and operate impedance bridges for analog circuits (CE).

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1987
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Electronics	PROGRAM NUMBER:	8730000
COURSE TITLE:	Electronics 5	COURSE NUMBER:	8730050

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for developing proficiency in digital devices.

06.0 DEMONSTRATE PROFICIENCY IN DIGITAL DEVICES--The student will be able to:

06.01 Define and apply numbering systems (hex., bin., and oct.) to codes and arithmetic (CE).
06.02 Analyze/minimize logic circuits using Boolean operations (CE).
06.03 Set up and operate a VOM for digital devices (CE).
06.04 Set up and operate a DVM for digital devices (CE).
06.05 Set up and operate logic probes for digital devices (CE).
06.06 Set up and operate power supplies for digital devices and solve power distribution and noise problems (CE).
06.07 Set up and operate pulsers for digital devices (CE).
06.08 Set up and operate oscilloscopes for digital devices (CE).
06.09 Set up and operate logic analyzers for digital devices (CE).
06.10 Set up and operate pulse generators for digital devices (CE).
06.11 Set up and operate counters for digital devices (CE).
06.12 Identify types of logic gates and their truth tables (CE).
06.13 Construct logic gates using discrete components (CE).
06.14 Troubleshoot logic gates (CE).
06.15 Analyze types of flip-flops and their truth and excitation tables (CE).
06.16 Construct flip-flops using discrete components (CE).
06.17 Troubleshoot flip-flops (CE).
06.18 Identify, define, and measure characteristics of integrated circuit IC logic families (CE).
06.19 Identify types of registers and counters (CE).
06.20 Construct registers and counters using flip-flops and logic gates (CE).
06.21 Troubleshoot registers and counters (CE).
06.22 Analyze clock and timing circuits (CE).
06.23 Construct clock and timing circuits (CE).
06.24 Troubleshoot clock and timing circuits (CE).
06.25 Identify and relate types of logic-arithmetic circuits (CE).
06.26 Construct logic-arithmetic circuits (CE).
06.27 Troubleshoot logic-arithmetic circuits (CE).

Electronics 5 - Continued

06.28 Identify types of encoding and decoding devices (CE).
06.29 Construct encoders and decoders (CE).
06.30 Troubleshoot encoders and decoders (CE).
06.31 Identify types of multiplexer and demultiplexer circuits (CE).
06.32 Construct multiplexer and demultiplexer circuits (CE).
06.33 Troubleshoot multiplexer and demultiplexer circuits (CE).
06.34 Identify types of memory circuits (static, dynamic, volatile, nonvolatile, etc.) (CE).
06.35 Use memory devices in circuits (CE).
06.36 Troubleshoot memory-device circuits (CE).
06.37 Relate the uses of digital-to-analog and analog-to-digital conversions (CE).
06.38 Construct digital-to-analog and analog-to-digital circuits (CE).
06.39 Troubleshoot digital-to-analog and analog-to-digital circuits (CE).
06.40 Identify types of displays (LED, LCD, etc.) (CE).
06.41 Construct display circuits (CE).
06.42 Troubleshoot display circuits (CE).

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Electronics — PROGRAM NUMBER: 8730000

COURSE TITLE: Electronics 6 — COURSE NUMBER: 8730060

COURSE DESCRIPTION:

This course is designed to provide instruction in developing technical recording and reporting skills and in demonstrating employability skills.

07.0 DEMONSTRATE PROFICIENCY IN MICROPROCESSING--The student will be able to:

07.01 Identify CPU (Architecture) building blocks and their uses (CE).
07.02 Analyze BUS concepts (CE).
07.03 Analyze various memory schemes (CE).
07.04 Set up and operate a VOM for microprocessing analysis (CE).
07.05 Set up and operate a DVM for microprocessing analysis (CE).
07.06 Set up and operate power supplies for microprocessor use (CE).
07.07 Set up and operate oscilloscopes for microprocessors (CE).
07.08 Set up and operate logic/data analyzers for microprocessor de-bug (CE).
07.09 Identify types of input and output devices and peripherals (PIA's, UART's, etc.) (CE).
07.10 Interface input and output ports (RS-232, RS-422, etc.) (CE).
07.11 Troubleshoot input and output ports (CE).
07.12 Execute computer instruction sets (CE).

08.0 DEMONSTRATE PROFICIENCY IN TECHNICAL RECORDING AND REPORTING --The student will be able to:

08.01 Draw and interpret electronic schematics (CE).
08.02 Record data and design curves and graphs (CE).
08.03 Write reports and make oral presentations (CE).
08.04 Maintain test logs (CE).
08.05 Make equipment-failure reports (CE).
08.06 Specify and requisition simple electronic components (CE).
08.07 Compose technical letters and memoranda (CE).
08.08 Write formal reports of laboratory experiences (CE).
08.09 Draft preventive maintenance and calibration procedures (CE).

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents that may be required when applying for a job.

09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Engineering Model Making

CODE NUMBER: Secondary ______ Postsecondary ETD0108

Florida CIP IN15.010102

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-17

CERTIFICATION COVERAGE: ENG MOD 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as plastic model makers (601.381-030), sheet metal model makers (804.281-010), wood model makers (661.380-010), model makers (777.261-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the construction of scale models of objects to be built or constructed.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the use of a variety of materials including plastic, metal and wood which is shaped, cut, and assembled into precision scale models of objects.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 900 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Select model construction materials, methods and processes.
02. Use woodworking, metalworking, and plastics cutting and forming machine.
03. Polish, paint and color code individual parts.
04. Read, interpret and work from free hand sketches, plot sketches, flow sheets, flow layouts, blueprints, photo-drawings, and photographs.
05. Precision measure to full-size or scale, three-dimensional models of products such as industrial plants and machinery, aircraft, appliances, and buildings.

06. Assemble parts using various fasteners and joining methods.
07. Construct topographical models.
08. Construct machine models (material flow).
09. Construct lay-out models (mechanical models).
10. Construct training models with moving parts.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial SECONDARY NUMBER: ________

PROGRAM TITLE: Engineering Model Making POSTSECONDARY NUMBER: ETD0108

01.0 SELECT MODEL CONSTRUCTION MATERIALS, METHODS AND PROCESSES--The student will be able to:

01.01 Determine scale based on use, stripping requirements and detail requirements.
01.02 Explain the strength, durability and related characteristics of materials.
01.03 Develop a model construction schedule.
01.04 Lay out and assemble a complete model.
01.05 Identify acrylic, butyrate, ABS and foam.

02.0 USE WOODWORKING, METALWORKING, AND PLASTICS CUTTING AND FORMING MACHINE--The student will be able to:

02.01 Demonstrate safe and proper use of hand tools.
02.02 Demonstrate safe and proper use of power tools.
02.03 Cut pipe to fit between fittings.
02.04 Bend plastic coated wire pipe.
02.05 Cut flat stock to specified tolerances.

03.0 POLISH, PAINT AND COLOR CODE INDIVIDUAL PARTS--The student will be able to:

03.01 Polish on burnish metal with power polishing equipment.
03.02 Develop color coding scheme for a given project.
03.03 Color code a model to American National Standards Institute (ANSI) standards.
03.04 Touch up a project.

04.0 READ, INTERPRET AND WORK FROM FREE HAND SKETCHES, PLOT SKETCHES, FLOW SHEETS, FLOW LAYOUTS, BLUEPRINTS, PHOTO-DRAWINGS, AND PHOTOGRAPHS--The student will be able to:

04.01 Read and interpret concrete symbols and specifications.
04.02 Read and interpret structural steel drawings and specifications.
04.03 Perform a preliminary model review.
04.04 Read and interpret piping blueprints, schematics, and symbols.
04.05 Read and interpret AVAC blueprint and schematics.

05.0 PRECISION MEASURE TO FULL-SIZE OR SCALE, THREE-DIMENSIONAL MODELS OF PRODUCTS SUCH AS INDUSTRIAL PLANTS AND MACHINERY, AIRCRAFT, APPLIANCES, AND BUILDINGS--The student will be able to:

05.01 Demonstrate the use of measuring instruments.
05.02 Convert full size measurements to scale.

06.0 ASSEMBLE PARTS USING VARIOUS FASTENERS AND JOINING METHODS--The student will be able to:

06.01 Join plastic with glue or mastic.
06.02 Join wood with glue.
06.03 Solder metal.
06.04 Join wood with countersink screws.

07.0 CONSTRUCT TOPOGRAPHICAL MODELS--The student will be able to:

07.01 Utilizing a grid system calculate coordinates and spacing.
07.02 Update plot plans.
07.03 Determine high point of grade.
07.04 Develop model base index.

08.0 CONSTRUCT MACHINE MODELS (MATERIAL FLOW)--The student will be able to:

08.01 Interpret flow sheet symbols and flow sheets.
08.02 Locate and identify instrument symbols.
08.03 Locate and identify pump symbols.
08.04 Identify equipment symbols.
08.05 Interpret piping symbols and specifications.
08.06 Locate, identify and interpret valve symbols.
08.07 Fabricate a model incorporating plastic piping, plastic valves and plastic vessels.

09.0 CONSTRUCT LAY-OUT MODELS (MECHANICAL MODELS)--The student will be able to:

- 09.01 Read and interpret steel specifications.
- 09.02 Construct a scale model structure.
- 09.03 Read and interpret vendor prints.
- 09.04 Interpret equipment drawings.
- 09.05 Fabricate equipment.
- 09.06 Fabricate vessels.

10.0 CONSTRUCT TRAINING MODELS WITH MOVING PARTS--The student will be able to:

- 10.01 Interpret blueprints and schematics.
- 10.02 Perform a preliminary model review.
- 10.03 Determine economy of arrangement.
- 10.04 Determine accessibility of appropriate parts.
- 10.05 Compute clearances.
- 10.06 Construct basic models.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

- 11.01 Conduct a job search.
- 11.02 Secure information about a job.
- 11.03 Identify documents which may be required when applying for a job interview.
- 11.04 Complete a job application form correctly.
- 11.05 Demonstrate competence in job interview techniques.
- 11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
- 11.07 Identify acceptable work habits.
- 11.08 Demonstrate knowledge of how to make job changes appropriately.
- 11.09 Demonstrate acceptable employee health habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

- 12.01 Define entrepreneurship.
- 12.02 Describe the importance of entrepreneurship to the American economy.
- 12.03 List the advantages and disadvantages of business ownership.
- 12.04 Identify the risks involved in ownership of a business.
- 12.05 Identify the necessary personal characteristics of a successful entrepreneur.
- 12.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Engineering Related Technology

CODE NUMBER: Secondary ____ Postsecondary ETG0001

Florida CIP IN15.999900

SECONDARY SCHOOL CREDITS ____ COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVELS(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 13-15

CERTIFICATION COVERAGE: TEC MECH @ 7 TEC CONSTR @ 7 BLDG CONST @ 7
TEC ELEC @ 7 ELECTRONIC 7 ANY IND EDUCATION LEVEL 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare individuals for advanced training that may result in employment as Engineering Assistants, Mechanical Equipment (007.161-018) or as engineering assistants, engineering aides, or engineering helpers in any one of the various fields of engineering; to prepare individuals for advanced training that may result in employment as Engineering Drawing Checkers (007.267-010), Plan Checkers (168.267-102), or Computer-Output-Microfiche Operators (976.382-026); to prepare individuals for advanced training leading to employment as Assistant Drafters (017.281-018), Computer-Assisted Drafters (017.261-014), or as Drafters in any one of the various fields of engineering; to prepare individuals for advanced training leading to employment as Mechanical Engineering Technicians (007.161-016), Electrical Technicians (003.161-010), Electronics Technicians (003.161-014), Heat-Transfer Technicians (007.181-010), Chemical Engineering Technicians (008.261-010), Industrial Engineering Technicians (012.267-010), or as Engineering Technicians in any one of the other fields of engineering; or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, engineering-related general education skills (English, mathematics, physics); familiarity with the tools, machinery, and equipment appropriate to various fields of engineering; basic drafting skills; familiarity with working drawings and blueprints; technical recording and reporting; and an assortment of miscellaneous engineering-related skills to provide a broad base of knowledge to support advanced training in specialty areas.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction and experience in the recording and reporting of engineering data, the application of problem-solving techniques and mathematically-derived solutions to engineering problems or projects, production of engineering drawings and working drawings, the drawing off of bills of materials from engineering or shop drawings, the application of appropriate engineering codes and specifications, the preparation of data or laboratory logbooks, the application of principles of physics, and practical experience in the application of safety principles and procedures.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communicatons, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 450 hours.

IV. INTENDED OUTCOMES: After sucessfully completing this program, the individual will be able to:

01. Demonstrate engineering-related language skills.
02. Apply engineering-related mathematical concepts and perform engineering-related calculations.
03. Demonstrate engineering-related applied physics skills.
04. Apply and use safety rules and procedures.
05. Apply engineering-related shop or laboratory skills.
06. Demonstrate knowledge and use of engineering-related tools, machinery, and equipment.
07. Apply engineering-related basic drafting skills.
08. Demonstrate a basic knowledge of engineering-related working drawings.
09. Demonstrate engineering-related computer-assisted drafting skills.
10. Demonstrate proficiency in engineering-related technical recording and reporting.
11. Demonstrate and apply knowledge of miscellaneous engineering-related skills.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS	EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education	SECONDARY NUMBER: ________

PROGRAM TITLE: Engineering Related Technology	POSTSECONDARY NUMBER: ETG0001

01.0 DEMONSTRATE ENGINEERING-RELATED LANGUAGE SKILLS--The student will be able to:

01.01 Identify and define frequently used engineering related technology terms
01.02 Determine the main idea of engineering related memos and instructions
01.03 Identify and list the order of events in a set of engineering specifications/instructions
01.04 Write a statement of how to follow a given set of written instructions
01.05 Obtain appropriate engineering related information from various sources
01.06 Identify the sources to obtain engineering related information
01.07 Demonstrate basic engineering related English writing skills
01.08 Write a paragraph presenting engineering related information in chronological order
01.09 Write an engineering related request for personnel, request for materials or supplies, request for information, notation of assignment, and change order that includes the necessary information for each
01.10 Write a clear, concise, and sequenced series of brief statements describing the steps of an engineering related process or event
01.11 Use a proper form when writing a simple engineering related business letter and addressing an envelope for it
01.12 Write an engineering related letter of request, adjustment, complaint, application, or opinion which contains necessary and accurate information
01.13 Proofread engineering related reports for spelling
01.14 Write an engineering related memorandum using a proper format

02.0 APPLY ENGINEERING-RELATED MATHEMATICAL CONCEPTS AND PERFORM ENGINEERING-RELATED CALCULATIONS--The student will be able to:

02.01 Solve basic mathematic problems
02.02 Solve basic algebraic problems
02.03 Solve basic geometric problems
02.04 Solve basic trigonometric problems
02.05 Define Physical Constant as used in mathematical equations
02.06 Define Mathematical Constant as used in mathematical equations
02.07 Define Independent Variable as used in mathematical equations
02.08 Define Dependent Variable as used in mathematical equations
02.09 Write the basic mathematical formula stating the relationship of force, pressure, and area.
02.10 Write the basic mathematical formula stating the relationship of weight, mass, and acceleration of gravity;
02.11 Write the basic mathematical formula stating the relationship of voltage, current, and electrical resistance;
02.12 Distinguish between fundamental and derived units and give examples of each from the International System of Units (SI) and English units
02.13 Explain the terms "dimensionless quantity" and "radian"
02.14 Name the seven basic SI units and give the symbol and quantity measured for each
02.15 Name the two supplementary SI units and give the symbol and quantity measured for each
02.16 List the derived SI unit and its symbol for frequency
02.17 Write, in the accepted notation, expressions indicating the products, quotients, and reciprocals of given SI units
02.18 Convert lengths in feet and inches to the equivalent length in SI units
02.19 Calculate a weight in pounds, given a mass in kilograms
02.20 Identify the term Angle
02.21 Apply the Pythagorean theorm to determine the third side of a triangle when given a right triangle with two known sides
02.22 Add and subtract two or more given vector quantities graphically, with the aid of a scale and protractor

02.23 Resolve a vector graphically, given the vector quantity with magnitude and direction specified and with the aid of a scale and protractor.
02.24 Draw a technically-acceptable graph from a table of experimental data suitable for plotting on rectangular-coordinate graph paper.
02.25 Write a given decimal number in scientific notation
02.26 Write a number given in scientific notation in decimal form
02.27 Multiply and divide numbers and solve equations using the three theorems of logarithms for products and quotients
02.28 Measure linear dimensions with a vernier caliper to the nearest 0.1 mm and with a micrometer caliper to the nearest 0.001 mm

03.0 DEMONSTRATE ENGINEERING-RELATED APPLIED PHYSICS SKILLS--The student will be able to:

03.01 Demonstrate applied skills in mechanics
03.02 Apply and solve vectors
03.03 Solve force and motion problems
03.04 Solve work, energy, and power problems
03.05 Solve friction problems
03.06 Solve circular motion problems
03.07 Solve rotational motion problems
03.08 Solve problems involving the properties of solids
03.09 Solve problems involving the properties of liquids
03.10 Solve problems involving the properties of gases
03.11 Demonstrate applied skills in heat, light and soundl
03.12 Solve temperature and heat problems
03.13 Solve change-of-state problems
03.14 Solve heat transfer problems
03.15 Solve thermodynamic problems
03.16 Solve refrigeration and air conditioning problems
03.17 Solve harmonic motion problems
03.18 Solve sound wave problems
03.19 Solve light problems
03.20 Solve optical problems
03.21 Demonstrate applied skills in electricity and magnetism
03.22 Solve electric circuit problems
03.23 Solve electro-magnetic problems
03.24 Solve alternating current problems
03.25 Solve generator and motor problems
03.26 Solve electrostatic problems
03.27 Solve magnetism problems
03.28 Apply Knowledge of strengths of materials
03.29 Solve equilibrium problems
03.30 Solve stress and strain problems
03.31 Solve centroid and inertia problems
03.32 Solve connection/joint problems
03.33 Solve problems with beam stresses
03.34 Solve torsion problems
03.35 Solve compression problems
03.36 Solve tension problems
03.37 Solve force combination problems

04.0 APPLY AND USE SAFETY RULES AND STANDARDS--The student will be able to:

04.01 Demonstrate knowledge and use of general safety rules
04.02 Apply general shop or laboratory safety rules and procedures
04.03 Demonstrate the operation of shop safety devices
04.04 Apply fire safety rules and procedures
04.05 Apply rules and procedures for electrical safety
04.06 Apply safety rules and procedures for installing or using control panels or other electromechanical or electronic devices
04.07 Apply safety rules and procedures applicable to stationary or moving machinery and the use and maintenance of machine safety guards
04.08 Apply safety rules and procedures applicable to the use of moving transports (forklifts, conveyors, small electric trucks and flatbeds, etc.) and those to be followed where such transport is being operated
04.09 Apply safety rules and procedures to be followed when operating or using hoists, cranes, elevators, and other lifting equipment

04.10 Apply safety rules and procedures to be followed when constructing or using scaffolding
04.11 Demonstrate safety procedures to be followed in areas where heavy equipment (earth haulers, dump trucks, cranes, scrapers, bulldozers, various heavy trucks, etc.) is being operated
04.12 Demonstrate minimal first-aid skills
04.13 Identify safety headgear and where, how, and why it is to be used
04.14 Identify safety straps and belts and where, how, and why they are to be used
04.15 Identify safety clothing (gloves, nets, aprons, goggles, soft-soled shoes or caulked boots, etc.) and where, how, and why it is to be used
04.16 Determine and demonstrate how to apply the OSHA regulations regarding manufacturing enclosures and machinery

05.0 APPLY ENGINEERING-RELATED SHOP OR LABORATORY SKILLS--The student will be able to:

05.01 Apply appropriate reading and writing skills in the writing and preparation of shop or laboratory reports or logbooks and in the technical recording and reporting of shop or laboratory data
05.02 Apply appropriate mathematical concepts and calculations to solve given shop or laboratory projects or assignments
05.03 Apply appropriate physics concepts and calculations in the solution of given shop or laboratory projects or assignments
05.04 Apply appropriate safety rules, regulations, and procedures in a shop or laboratory setting
05.05 Apply basic drafting skills to the solution of engineering-related problems or the accumulation and presentation of engineering data in a shop or laboratory setting
05.06 Apply knowledge of working drawings to produce usable shop or laboratory drawings for various engineering fields and to draw off representative bills of materials from given working drawings
05.07 Demonstrate the ability to research, locate, and apply the appropriate codes to given engineering problems when presented in a shop or laboratory situation

06.0 DEMONSTRATE KNOWLEDGE AND USE OF ENGINEERING-RELATED TOOLS, MACHINERY, AND EQUIPMENT--The student will be able to:

06.01 Identify and explain the use of the hand tools used in the construction industries (carpentry, masonry, plumbing, welding, wiring, etc.)
06.02 Identify and explain the use of the smaller power tools used in the construction industries (carpentry, masonry, plumbing, welding, wiring, etc.)
06.03 Identify and explain the use of the larger tools and machinery used in the construction industries (carpentry, masonry, plumbing, welding, wiring, etc.)
06.04 Identify and explain the use of the heavy machinery and equipment used in the construction industries (carpentry, masonry, plumbing, welding, wiring, etc.)

07.0 APPLY ENGINEERING-RELATED BASIC DRAFTING SKILLS--The student will be able to:

07.01 Use Basic Drafting Tools and Equipment
07.02 Demonstrate the proper use and care of drawing equipment
07.03 Select proper drawing instruments to complement the drafting media (mylar, vellum, etc.)
07.04 Select correct pencils or pens to draw proper line weights
07.05 Use reproduction techniques and materials to construct a tracing
07.06 Produce sepia, blueline, mylar, and electrostatic copies
07.07 Make Diazo (Ozalid) copies of original drawings
07.08 Set up a drafting machine and drafting equipment
07.09 Construct borders, information blocks, and center drawings
07.10 Construct freehand sketches
07.12 Read and transfer measurements
07.13 Letter freehand (letters and numerals)
07.14 Draw intersections of lines and planes

07.15 Letter with mechanical lettering devices and templates
07.16 Apply established drafting standards
07.17 Construct regular polygons and ellipses
07.18 Draw tangents to arcs, lines, and circles
07.19 Construct involutes
07.20 Draw intersections of solids
07.21 Prepare a simple orthographic drawing
07.22 Identify the use and application of orthographic drawings
07.23 Draw simple auxiliary views/revolutions revolutions
07.24 Draw simple sectional views/conventions
07.25 Identify the symbols used to represent different materials
07.26 Apply dimensioning practices and techniques to drawings
07.27 Construct the lines used to dimension drawings
07.28 Identify the use and application of dimensioning practices
07.29 Apply conventional tolerances
07.30 Read and convert measurements
07.31 Construct simple pictorial drawings
07.32 Construct simple isometric drawings
07.33 Construct simple oblique drawings
07.34 Identify the use and application of pictorial drawings
07.35 Construct a simple perspective drawing
07.36 Construct several types of simple graphic charts
07.37 Identify the use and application of graphic charts

08.0 DEMONSTRATE A BASIC KNOWLEDGE OF ENGINEERING-RELATED WORKING DRAWINGS --The student will be able to:

08.01 Construct drafting symbols
08.02 Produce simple representative engineering drawings
08.03 Draw off and prepare bills of materials

09.0 DEMONSTRATE ENGINEERING-RELATED COMPUTER-ASSISTED DRAFTING SKILLS--The student will be able to:

09.01 Operate CAD equipment and peripherals
09.02 Demonstrate data base management skills
09.03 Perform applied CAD basic drafting skills
09.04 Generate simple isometric views
09.05 Generate simple assemblies, details, and schematics
09.06 Apply notes and special instructions
09.07 Manipulate views
09.08 Apply scaling
09.09 Apply dimensioning
09.10 Develop simple three-dimensional drawings
09.11 Select appropriate line work
09.12 Generate simple layouts
09.13 Demonstrate data processing management skills
09.14 Develop execute lists using command language
09.15 Write a simple FORTRAN program
09.16 Interpret printed output
09.17 Demonstrate post-processing file management skills

10.0 DEMONSTRATE PROFICIENCY IN ENGINEERING-RELATED TECHNICAL RECORDING AND REPORTING--The student will be able to:

10.01 Create and interpret schematics
10.02 Record data and design curves and graphs
10.03 Write reports and make oral presentations
10.04 Maintain test and engineering data logs
10.05 Make equipment failure reports
10.06 Specify and requisition simple parts and supplies
10.07 Compose technical letters and memoranda
10.08 Write formal reports of laboratory experiences
10.09 Draft preventive maintenance and calibration procedures

11.0 DEMONSTRATE AND APPLY KNOWLEDGE OF MISCELLANEOUS ENGINEERING-RELATED SKILLS--The student will be able to:

11.01 Demonstrate knowledge and use of practical geology and soils

11.02 Demonstrate knowledge and use of scheduling techniques
11.03 Apply the ability to create engineering related PERT charts to the scheduling of a simple hypothetical engineering project
11.04 Apply the ability to create engineering related CPM charts to the scheduling of a simple hypothetical engineering project
11.05 Apply the ability to create engineering related GANT charts or lists to the scheduling of a simple hypothetical engineering project
11.06 Demonstrate knowledge and use of slide rules, calculators, and other general engineering related tools
11.07 Demonstrate knowledge and use of engineering related reference materials
11.08 Demonstrate the ability to read and interpret engineering related blueprints
11.09 Demonstrate knowledge and ability in engineering related problem solving
11.10 Demonstrate knowledge and use of engineering related trade terms and terminology

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search
12.02 Secure information about a job
12.03 Identify documents that may be required when applying for a job
12.04 Complete a job application form correctly
12.05 Demonstrate competence in job interview techniques
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
12.07 Identify acceptable work habits
12.08 Demonstrate knowledge of how to make job changes appropriately
12.09 Demonstrate acceptable employee health habits

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Floor Covering Installation

CODE NUMBER: Secondary 8721400 Postsecondary BCT0185

Florida CIP IN46.040500

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

____ Postsecondary Vocational x Other 10-12, 13-17, 21

CERTIFICATION COVERAGE: TEC CONSTR @ 7 BLDG CONST @ 7 FLOORING 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as ceiling tile installers, floorlayers (50024002), carpet cutters, carpet layers (50140600), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, classroom instruction and shop experiences in the preparation of floors for the layout, measuring, cutting, sewing, of sound-deadening or decorative covering for floors and walls. The preparation of floors for, and the layout, measuring, cutting and installation of linoleum and vinyl sheet floor covering and tile are included.

Listed below are the courses that comprise this program when offered at the secondary level:

8721410	Floor Covering Installation 1
8721420	Floor Covering Installation 2
8721430	Floor Covering Installation 3
8721440	Floor Covering Installation 4
8721450	Floor Covering Installation 5
8721460	Floor Covering Installation 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the basic hand tools and equipment including knee kickers, seaming irons, power stretchers, strippers, tile cutters, hand binding staplers, and hammer drills.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 900 hours.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate safe and efficient work practices.
02. Interpret blueprints and specifications.
03. Select, care for and use tools and materials.
04. Prepare surfaces.
05. Test and repair subfloors.
06. Apply coverings
07. Cut, seam and fit covering.
08. Demonstrate sketching, measuring, and drawing proficiency.
09. Demonstrate knowledge of material and cost estimates.
10. Demonstrate knowledge of current industry standards, practices and techniques.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial SECONDARY NUMBER: 8721400

PROGRAM TITLE: Floor Covering Installation POSTSECONDARY NUMBER: BCT0185

01.0 DEMONSTRATE SAFE AND EFFICIENT WORK PRACTICES--The student will be able to:

01.01 Identify commonly used tools and safety practices.
01.02 Demonstrate proper methods of lifting and carrying.
01.03 Explain safety rules to be followed at all times.

02.0 INTERPRET BLUEPRINTS AND SPECIFICATIONS--The student will be able to:

02.01 Identify commonly used symbols.
02.02 Determine area from dimensions given on prints.

03.0 SELECT, CARE FOR AND USE TOOLS AND MATERIALS--The student will be able to:

03.01 Demonstrate use of cutting and seaming tools.
03.02 Demonstrate use of carpet installation tools.
03.03 Demonstrate the proper method for installation floor covering with mastic.

04.0 PREPARE SURFACES--The student will be able to:

04.01 Explain the basic fundamentals of preparing surfaces for installation of floor covering.
04.02 Explain and demonstrate preparation of wood surfaces for application of floor covering.
04.03 Explain and demonstrate preparation of masonry surfaces for application of floor covering.

05.0 TEST AND REPAIR SUBFLOORS--The student will be able to:

05.01 Explain methods of determining a structurally sound surface.
05.02 Explain and demonstrate repair of a masonry surface.
05.03 Explain and demonstrate repair of a wooden surface.

06.0 APPLY COVERING--The student will be able to:

06.01 Identify materials and methods of applying them.
06.02 Install carpet.
06.03 Install vinyl.
06.04 Install vinyl tile.

07.0 CUT, SEAM AND FIT COVERING--The student will be able to:

07.01 Match, cut, fit, and join sections of patterned vinyl.
07.02 Match, cut, fit, and join sections of patterned or sculptured carpet.
07.03 Join and sew carpet.
07.04 Identify types of installations.
07.05 Explain the effects of temperature and humidity on floor covering materials.

08.0 DEMONSTRATE SKETCHING, MEASURING, AND DRAWING PROFICIENCY--The student will be able to:

08.01 Measure an area and complete floor covering requirements.
08.02 Perform an installation survey to develop sketches and notes for sequence of installation.

09.0 DEMONSTRATION KNOWLEDGE OF MATERIAL AND COST ESTIMATES--The student will be able to:

09.01 Solve material and cost estimating problems.
09.02 Maintain service, installation and time records.
09.03 Write a field report on apparent faulty product.

10.0 DEMONSTRATE KNOWLEDGE OF CURRENT INDUSTRY STANDARDS PRACTICES AND TECHNIQUES--The student will be able to:

10.01 Demonstrate understanding of carpet laying terminology.
10.02 Explain the importance of good customer relations.
10.03 Explain the new trends in the used of floor covering materials.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial COURSE CREDIT: 1
PROGRAM TITLE: Floor Covering Installation PROGRAM NUMBER: 8721400
COURSE TITLE: Floor Covering Installation 1 COURSE NUMBER: 8721410

COURSE DESCRIPTION:

This course is designed to provide instruction in the proper, safe use and care of hand and power tools related to floor covering trades. Installation of Mastic Applied floor covering is included.

01.0 DEMONSTRATE SAFE AND EFFICIENT WORK PRACTICES--The student will be able to:

01.01 Identify commonly used tools and safety practices.
01.02 Demonstrate proper methods of lifting and carrying.
01.03 Explain safety rules to be followed at all times.

03.0 SELECT, CARE FOR AND USE TOOLS AND MATERIALS--The student will be able to:

03.01 Demonstrate use of cutting and seaming tools.
03.02 Demonstrate use of carpet installation tools.
03.03 Demonstrate the proper method for installation floor covering with mastic.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial COURSE CREDIT: 1
PROGRAM TITLE: Floor Covering Installation PROGRAM NUMBER: 8721400
COURSE TITLE: Floor Covering Installation 2 COURSE NUMBER: 8721420

COURSE DESCRIPTION:

This course is designed to provide instruction in the identification of commonly used symbols and determining area from dimensions given on blueprints, carpet laying terminology, trends in floor covering and customer relations.

02.0 INTERPRET BLUEPRINTS AND SPECIFICATIONS--The student will be able to:

02.01 Identify commonly used symbols.
02.02 Determine area from dimensions given on prints.

10.0 DEMONSTRATE KNOWLEDGE OF CURRENT INDUSTRY STANDARDS PRACTICES AND TECHNIQUES--The student will be able to:

10.01 Demonstrate understanding of carpet laying terminology.
10.02 Explain the importance of good customer relations.
10.03 Explain the new trends in the used of floor covering materials.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial COURSE CREDIT: 1
PROGRAM TITLE: Floor Covering Installation PROGRAM NUMBER: 8721400
COURSE TITLE: Floor Covering Installation 3 COURSE NUMBER: 8721430

COURSE DESCRIPTION:

This course is designed to provide instruction in material and cost estimates, develop job sketches and drawings, service, installation and time records.

08.0 DEMONSTRATE SKETCHING, MEASURING, AND DRAWING PROFICIENCY--The student will be able to:

08.01 Measure an area and complete floor covering requirements.

08.02 Perform an installation survey to develop sketches and notes for sequence of installation.

09.0 DEMONSTRATION KNOWLEDGE OF MATERIAL AND COST ESTIMATES--The student will be able to:

09.01 Solve material and cost estimating problems.
09.02 Maintain service, installation and time records.
09.03 Write a field report on apparent faulty product.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Floor Covering Installation
PROGRAM NUMBER: 8721400

COURSE TITLE: Floor Covering Installation 4
COURSE NUMBER: 8721440

COURSE DESCRIPTION:

This course is designed to provide instruction in the proper preparation of various floor surfaces for the application of various floor coverings.

04.0 PREPARE SURFACES--The student will be able to:

04.01 Explain the basic fundamentals of preparing surfaces for installation of floor covering.
04.02 Explain and demonstrate preparation of wood surfaces for application of floor covering.
04.03 Explain and demonstrate preparation of masonry surfaces for application of floor covering.

05.0 TEST AND REPAIR SUBFLOORS--The student will be able to:

05.01 Explain methods of determining a structurally sound surface.
05.02 Explain and demonstrate repair of a masonry surface.
05.03 Explain and demonstrate repair of a wooden surface.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Floor Covering Installation
PROGRAM NUMBER: 8721400

COURSE TITLE: Floor Covering Installation 5
COURSE NUMBER: 8721450

COURSE DESCRIPTION:

This course is designed to provide instruction in the installation of various types and methods of floor coverings.

06.0 APPLY COVERING--The student will be able to:

06.01 Identify materials and methods of applying them.
06.02 Install carpet.
06.03 Install vinyl.
06.04 Install vinyl tile.

07.0 CUT, SEAM AND FIT COVERING--The student will be able to:

07.01 Match, cut, fit, and join sections of patterned vinyl.
07.02 Match, cut, fit, and join sections of patterned or sculptured carpet.
07.03 Join and sew carpet.
07.04 Identify types of installations.
07.05 Explain the effects of temperature and humidity on floor covering materials.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Floor Covering Installation PROGRAM NUMBER: 8721400

COURSE TITLE: Floor Covering Installation 6 COURSE NUMBER: 8721460

COURSE DESCRIPTION:

This course is designed to provide instruction in practical application of skills learned in previous courses and employability skills.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Gas Service, Installation, and Repair

CODE NUMBER: Secondary ___ Postsecondary EER0319

Florida CIP IN47.049901

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

___ Postsecondary Vocational ___ Other 13 - 17

CERTIFICATION COVERAGE: WASH MACH @ 7 APPLI REPR 7 GAS FITTER 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment with occupational titles as plant utility persons (953.382-010), cylinder fillers (953.387-010), cylinder delivery persons (903.683-018), bulk delivery persons (route salesperson) (903.683-018), tank and cylinder installers (953.387-010), service persons (transfer and customer equipment) (914.585-010), appliance service persons (637.261-018), or to provide supplemental training for persons previously or currently employed in LP gas or natural gas occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, blueprint reading, applicable building codes, and installation and repair procedures.

II. LABORATORY ACTIVITIES: Shop or activities are an integral part of this program and provide instruction in the installation, maintenance and repair of lines, meters and controls.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communications, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher, and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 contact hours (2160 clock hours).

IV. INTENDED OUTCOMES: After successfuly completing this program the student will be able to:

01. Demonstrate a proficiency in LP-GAS Operations and Safety.
02. Demonstrate a proficiency in LP-GAS transportation and delivery.
03. Demonstrate a proficiency in LP-GAS tanks, cylinders, and equipment.

04. Demonstrate a proficiency in LP-GAS liquid and vapor distribution systems and equipment.
05. Demonstrate a proficiency in LP-GAS liquid transfer systems and equipment.
06. Demonstrate a proficiency in using LP-GAS as a motor fuel.
07. Demonstrate a proficiency in LP-GAS maintenance.
08. Demonstrate employability skills.
09. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Gas Service, Installation, and Repair POSTCONDARY NUMBER: EER0319

01.0 DEMONSTRATE A PROFICIENCY IN LP-GAS OPERATIONS AND SAFETY--The student will be able to:

01.001 Determine the primary tasks required to perform your job.

01.002 Determine the primary training that you must complete to perform your job.

01.003 Select the proper GUIDEBOOKS on performing the tasks in your job.

01.004 Trace the history of the liquid petroleum (LP) gas industry.

01.005 Identify the primary sources of LP-gas.

01.006 Identify the major blends of LP-gas used by the industry today.

01.007 List the physical properties of LP-gas.

01.008 Explain the effect of heat and pressure on the boiling point of liquids.

01.009 Explain the way LP-gases behave when they are stored in a tank or cylinder.

01.010 Explain the characteristics of LP-gas combustion.

01.011 Identify the major categories of customers in the LP-gas industry.

01.012 Identify the categories of customers served by your company.

01.013 Identify the LP-gas applications in each customer category serviced by your company.

01.014 Identify the basic parts of a DOT/ICC cylinder installation.

01.015 Identify the basic parts of an ASME tank installation.

01.016 Identify the basic parts of the bulk plant storage tank.

01.017 Identify the basic parts of the unloading station at the bulk plant.

01.018 Identify the basic parts of the filling or dispensing stations at the bulk plant.

01.019 State the purpose and objectives of state and national LP-gas industry associations.

01.020 Explain the various manufacturing standards that apply to the LP-gas industry.

01.021 Explain the purpose of independent testing laboratories that apply to the LP-gas industry.

01.022 Name the various LP-gas operations and fire safety codes that apply to your area or locale.

01.023 Explain the agencies that enforce regulations in your area or locale.

01.024 State the driver qualifications for specific motor vehicle operations.

01.025 State the driver maintenance required for general and specific motor vehicles.

01.026 State the rules for defensive driving.

01.027 State the proper rules to follow in the event of an accident.

01.028 List the precautions to follow when working at the plant.

01.029 List the precautions to follow for personal safety on the job.

01.030 List the general accident prevention techniques for fire safety.

01.031 List the general accident prevention techniques for hazardous material safety.

01.032 List the general accident prevention techniques for machinery and mechanical safety.

01.033 List the general accident prevention techniques for electrical safety.

01.034 List the general accident prevention techniques for material handling safety.

01.035 List the general accident prevention techniques for climbing safety.

01.036 Identify the two major hazards when working with LP-gas.

01.037 Identify the sources of LP-gas leaks, spills, and discharges associated with your job.

01.038 List the precautions to be taken to avoid LP-gas leaks, spills, and discharges associated with your job.

01.039 List the precautions to be observed in handling an LP-gas leak, spill, or discharge in your job.

01.040 Identify the causes of a BLEVE (Boiling Liquid Expanding Vapor Explosion).

01.041 Identify the different ignition sources that may be present in your job that could cause a fire.
01.042 Identify the different flammable materials that you may use in your job.
01.043 List the precautions that should be observed to avoid fires.
01.044 List the precautions that should be observed in handling fires.
01.045 Identify the various types of hand tools.
01.046 Explain the purpose of each type of hand tool.
01.047 Explain the proper way to use each hand tool.
01.048 Explain the proper way to care for each hand tool.
01.049 Identify various sections of pipe according to material, size, and schedule.
01.050 Identify various sections of tubing according to material, size, and schedule.
01.051 Identify and describe the purpose of various pipe and tube fittings.
01.052 Select and use the proper tools for holding, cutting and threading pipe, as well as making a threaded pipe connection.
01.053 Select and use the proper tools for cutting, bending and flaring tubing, as well as making a flared tube connection.
01.054 Explain the importance of the customer to LP-gas operations.
01.055 Explain how knowing the needs of your customers helps to develop a good relationship with them.
01.056 Explain how developing the right attitude helps to develop a good relationship with customers.
01.057 Explain how knowing your own limitations helps to develop a good relationship with customers.
01.058 Explain how looking like a professional helps to develop a good relationship with customers.
01.059 Explain how conducting yourself like a professional helps to develop a good relationship with customers.
01.060 Explain how doing your job properly helps to develop a good relationship with customers.

02.0 DEMONSTRATE A PROFICIENCY IN LP-GAS TRANSPORTATION AND DELIVERY--The student will be able to:

02.001 Determine your particular job responsibilities.
02.002 Obtain your company operating procedures covering your job responsibilities.
02.003 Select the appropriate chapters in this GUIDEBOOK that you need to read to accomplish your job.
02.004 Explain the characteristics of LP-gas that affects its transfer with pumps.
02.005 Identify the major parts of a pump.
02.006 Explain the principles of transferring LP-gas with a pump.
02.007 Identify the major parts of a pump network.
02.008 Describe the types of operator maintenance required on pump networks.
02.009 Identify the major parts of LP-gas compressors and compressor protection devices.
02.010 Explain the procedures involved in compressor operations, including vapor recovery.
02.011 Explain the principles of efficient compressor operation.
02.012 List the basic requirements for compressor maintenance.
02.013 Identify the types of transfer lines used in an LP-gas transfer network.
02.014 Identify a liquid withdrawal valve used in an LP-gas transfer network.
02.015 Identify the types of manual shutoff valves used in a transfer network.
02.016 Identify an in-line automatic check valve used in a transfer network.
02.017 Identify a flow monitor used in a transfer network.
02.018 Identify a bulkhead and the emergency shutoff valves in a transfer network.
02.019 Identify the types of hose-end valves used in a transfer network.
02.020 Explain the basic guidelines for "pre-fill" inspections of the transfer equipment, container, and the transfer site.
02.021 Determine the maximum permitted filling level for containers filled by weight and by volume.

02.022 Locate and identify container fill connections and fittings.
02.023 Explain the principles of filling, including the use of vapor equalization lines.
02.024 Point out the location and explain the use of the valves and gauges installed on transports and tank cars.
02.025 Point out and explain the use of the safety equipment installed on transports and at unloading bulkheads and risers.
02.026 Inspect the transfer area for obstructions and hazards.
02.027 Guide the transport into position at the bulkhead and inspect it for damage.
02.028 Check, test, and gauge the contents of the transport tank.
02.029 Determine the maximum amount of LP-gas to be transferred into the plant storage tanks.
02.030 Connect liquid and vapor hoses between the transport and the plant bulkhead.
02.031 Unload the transport tank.
02.032 Prepare the transport for departure.
02.033 Secure a tank car for unloading.
02.034 Inspect the tank car.
02.035 Gauge and test the contents of the tank car.
02.036 Determine the maximum amount of LP-gas to be transferred to the plant storage tanks.
02.037 Connect liquid and vapor hoses between the tank car and the riser.
02.038 Prepare the tank car for departure.
02.039 Identify the valving and major features on portable cylinders.
02.040 Identify the valving and major features on exchange cylinders.
02.041 Identify the valving and major features on lift truck cylinders.
02.042 Identify the valving and major features on stationary cylinders.
02.043 Identify the valving and major features on motor fuel and RV tanks.
02.044 Identify the valving and major features on stationary tanks, including tanks at dispensing stations and multi-tank installations.
02.045 Determine when a DOT/ICC cylinder needs to be reinspected by reading the inspection date stamped on it.
02.046 Explain the safety precautions that apply to tank and cylinder filling operations at a dispensing station.
02.047 Inspect and maintain the transfer equipment at your dispensing station.
02.048 Inspect the transfer site and the container to be filled.
02.049 Prepare the container for filling.
02.050 Select the proper adaptor and connect the filler hose to the container.
02.051 Fill the container accurately by weight or by volume.
02.052 Bleed down and disconnect the filler hose.
02.053 Carry out post-filling inspections and procedures.
02.054 Explain the general safety precautions that apply to cylinder delivery operations.
02.055 Inspect cylinder delivery trucks and cylinder delivery equipment.
02.056 Identify the placarding requirements for cylinder delivery vehicles.
02.057 Inspect, load, and secure cargo.
02.058 Inspect storage areas at industrial sites and residential cylinder installations.
02.059 Exchange full for empty cylinders at industrial and residential sites.
02-060 Point out and describe the important parts of a bulk truck cargo tank.
02.061 Point out and describe the valves used control the flow of LP-gas into and out of the cargo tank.
02.062 Point out and describe the equipment in a bulk truck pump circuit.
02.063 Complete a pre-trip inspection of a bulk truck.
02.064 Position the bulk truck forfilling.
02.065 Set the liquid level gauge(s) on the bulk truck tank.
02.066 Connect the fill and vapor equalizing hoses to the bulk truck tank.
02.067 Fill the bulk truck tank.
02.068 Disconnect the hoses and prepare the truck for travel.
02.069 Select a route to the customer container.
02.070 Position the bulk truck for filling the customer container.

02.071 Inspect the container to be sure that it is suitable for LP-gas service.
02.072 Connect the fill hose and, if applicable, the vapor equalizing hose to the customer container.
02.073 Fill the customer container.
02.074 Disconnect the hose(s) from the customer container.
02.075 Prepare the bulk truck for your next delivery.
02.076 Select the proper equipment for evacuating or unloading a stationary ASME tank.
02.077 Determine the quanitity of LP-gas to be evacuated.
02.078 Locate and position all equipment at the evacuation site.
02.079 Connect all necessary hoses, fittings and equipment.
02.080 Pressure test all hoses and fittings.
02.081 Evacuate the container.
02.082 Bleed down and disconnect all hoses.
02.083 Explain the regulations and safety precautions you must observe when parking LP-gas delivery vehicles.
02.084 Explain the regulations and safety precautions you must observe when garaging LP-gas delivery vehicles for maintenance or repairs.

03.0 DEMONSTRATE A PROFICIENCY IN LP-GAS TANKS, CYLINDERS, AND EQUIPMENT--The student will be able to:

03.001 Identify the major parts of an ASME tank.
03.002 Identify and explain the basic markings of an ASME tank.
03.003 Identify the type of service and application of an ASME tank.
03.004 Identify the major parts of a DOT or ICC cylinder.
03.005 Identify and explain the required markings on DOT and ICC cylinders.
03.006 Identify the types of service and normal applications of DOT or ICC cylinders used in LP-gas service.
03.007 Identify the major parts of a DOT portable tank.
03.008 Identify the major parts of a DOT cargo tank.
03.009 Identify the major parts of a DOT rail car tank (tank car).
03.010 Explain the DOT design markings on a DOT portable tank.
03.011 Explain the DOT design markings on a DOT cargo tank.
03.012 Explain the DOT design markings on a DOT rail car tank (tank car).
03.013 Identify the type of service or application of a DOT cargo tank.
03.014 Identify the type of service or application of a DOT rail car tank (tank car).
03.015 Identify the major parts of a spring-loaded safety relief valve.
03.016 Explain the operation of a spring-loaded safety relieve valve.
03.017 Explain design markings on a spring-loaded safety relief valve.
03.018 Select and size a safety relief valve for a LP-gas container.
03.019 Identify the parts of a temperature gauge.
03.020 Identify the parts of a pressure gauge.
03.021 Identify the parts of a liquid level gauge.
03.022 Determine the proper application of a temperature gauge.
03.023 Determine the proper application of a pressure gauge.
03.024 Determine the proper application of a liquid level gauge.
03.025 Select a pressure gauge for a LP-gas container.
03.026 Select a liquid level gauge for a LP-gas container.
03.027 Identify the parts of a filler valve.
03.028 Identify the parts of an equalizing valve.
03.029 Identify the parts of a withdrawal valve.
03.030 Determine the proper application of filler valves.
03.031 Determine the proper application of equalizing valves.
03.032 Determine the proper appplication of withdrawal valves.
03.033 Select a filler valve for an ASME stationary tank.
03.034 Select an equalizing valve for an ASME stationary tank.
03.035 Select a withdrawal valve for an ASME stationary tank.
03.036 Disassemble and identify the major parts of a service valve.
03.037 Disassemble and identify the major parts of a combination service valve.
03.038 Select the proper service valve for a DOT/ICC exchange cylinder.
03.039 Select the proper service valve for a DOT/ICC cylinder filled on-site.
03.040 Select the proper service valve for an ASME stationary tank.
03.041 Select the proper service valve for an ASME mobile tank.

03.042 Size a stationary ASME tank for vapor withdrawal.
03.043 Size exchange cylinders for vapor withdrawal.
03.044 Size a stationary ASME tank for liquid withdrawal.
03.045 Select the proper equipment for evacuating or unloading a stationary ASME tank.
03.046 Locate and position all equipment at the evacuation site.
03.047 Connect all necessary hoses, fittings, and equipment.
03.048 Pressure test all hoses and fittings.
03.049 Determine the quantity of LP-gas to be evacuated.
03.050 Evacuate the container.
03.051 Bleed down and disconnect all hoses.
03.052 Evacuate as much LP-gas liquid from the container as possible (by pump, compressor, "gravity", etc.) in preparing for "flaring".
03.053 Select the proper site for flaring the remaining LP-gas in the container.
03.054 Select the proper equipment for flaring the remaining LP-gas in the container.
03.055 Connect all necessary hoses, fittings, burners, etc. for flaring.
03.056 Pressure test the flaring hoses, fittings, etc..
03.057 Flare the remaining LP-gas in the container.
03.058 Bleed down and disconnect all hoses, fittings, burners, etc..
03.059 Select the proper valves and accessories needed for container installation.
03.060 Prepare the valves and accessories for installation.
03.061 Prepare the container opening for the valve or gauge installation.
03.062 Apply thread sealing compound to male threads of the valve, gauge, or adaptor.
03.063 Install the container valve, gauge, or adaptor.
03.064 Install any necessary accessories.
03.065 Neutralize water moisture inside tanks and cylinders in preparing them for installation.
03.066 Purge air from the inside of tanks and cylinders in preparing them for installation.
03.067 Pressure test the tanks and cylinders to ensure that it is free from leaks (gas tight).
03.068 Evacuate or unload all ammonia from a nurse tank in preparing it for LP-gas service.
03.069 Completely purge the nurse tank with water.
03.070 Replace container valves (if necessary).
03.071 Purge the tank with LP-gas vapor.
03.072 Test the LP-gas vapor for ammonia contamination.
03.073 Remark the container according to federal, state, and local codes for LP-gas service (if necessary).
03.074 Size the ASME tank for the total effective load of the appliances.
03.075 Select a location for the tank at the customer site.
03.076 Select and prepare the tank, equipment, and tools for the installation.
03.077 Deliver the tank to the customer location.
03.078 Prepare a foundation or base for the tank.
03.079 Install the tank on the foundation.
03.080 Prepare the tank for service.
03.081 Explain any customer maintenance or safety precautions to the customer.
03.082 Size replaceable and stationary DOT/ICC cylinders for installation according to the total effective load of the appliances.
03.083 Select a location for the cylinder(s) to be installed at the customer site.
03.084 Select and prepare the cylinder(s), equipment, and tools for installation at the customer site.
03.085 Deliver the cylinder(s) for installation at the customer site.
03.086 Prepare a foundation or base for the installation of the cylinder(s) at the customer site.
03.087 Install the cylinder(s) on the foundation and prepare the cylinder(s) for service.
03.088 Explain any customer maintenance or safety precautions to the customer.
03.089 Determine the inspection and maintenance requirements for various LP-gas containers.
03.090 Properly inspect a LP-gas container to determine if it is suitable for continued service.

03.091 Determine the proper procedures to follow in order to correct any problem found during the inspection.
03.092 Perform visual inspection and requalification of DOT/ICC cylinders in accordance with CGA procedures.
03.093 Determine the type of requalification required for a DOT/ICC cylinder.
03.094 Record all important information on an inspection form.
03.095 Prepare the cylinder for inspection.
03.096 Inspect the cylinder for fire damage.
03.097 Inspect the cylinder for general distortion.
03.098 Inspect the neck of the cylinder for damage.
03.099 Inspect all parts for general damage (i., foot ring, data plate, etc.).
03.100 Weigh the cylinder.
03.101 Inspect the cylinder for dents.
03.102 Inspect the cylinder for cuts, gouges, and digs.
03.103 Inspect the cylinder for corrosion.
03.104 Pressure test the cylinder with LP-gas vapor.
03.105 Stamp the retest date on the neck ring or data plate of the cylinder.
03.106 Inspect, service, and maintain pressure gauges in a stationary ASME tank.
03.107 Inspect, service, and maintain liquid level gauges in a stationary ASME tank.
03.108 Inspect, service, and maintain safety relief valves in a stationary ASME tank.
03.109 Inspect, service, and maintain fill valves in a stationary ASME tank.
03.110 Inspect, service, and maintain service valves in a stationary ASME tank.
03.111 Inspect a service valve on a replaceable DOT cylinder.
03.112 Clean and repair the LP-gas tank or cylinder surface for painting.
03.113 Select and apply a primer or special coating (if necessary).
03.114 Select and apply the finish coat (if necessary).
03.115 Determine the required general markings for an ASME bulk tank.
03.116 Mark the tank (if necessary).
03.117 Determine the proper marking, labeling, and placarding for a DOT/ICC cylinder.
03.118 Determine the proper marking, labeling, and placarding for a DOT/ICC portable tank.
03.119 Determine the proper marking, labeling, and placarding for a DOT/ICC cargo tank.
03.120 Determine the proper marking, labeling, and placarding for a DOT/ICC tank car.

04.0 DEMONSTRATE A PROFICIENCY IN LP-GAS LIQUID AND EQUIPMENT--The student will be able to:

04.001 Determine the purpose and major parts of a LP-gas regulator.
04.002 Explain the basic operation of a regulator.
04.003 Determine the two basic types of regulator systems.
04.004 Determine the various applications for the basic types of regulator systems.
04.005 Identify the common types of distribution line materials approved for use with LP-gas.
04.006 Select the types of pipe and fittings which can be used with the different categories of system pressures.
04.007 Select the types of tube and fittings which can be used with the different categories of system pressures.
04.008 Name and describe an approved low pressure flexible (appliance) connector.
04.009 Name and describe two common types of high pressure flexible connectors.
04.010 Select the type of regulator system needed for the installation.
04.011 Calculate the total appliance demand of the installation.
04.012 Determine the required delivery or outlet pressure needed for the installation.
04.013 Determine the expected minimum inlet pressure to the regulator(s).
04.014 Obtain the manufacturer's flow capacity ratings for the regulator.

04.015 Select the correct regulator(s) for the installation (using the manufacturer's literature).
04.016 Make a sketch of the entire distribution system including the location of the container(s) and appliance(s).
04.017 Determine the length of the longest section of line through which the operating pressure must be maintained.
04.018 Determine the operating pressure(s) and required flow capacities of all lines in the distribution system.
04.019 Select the appropriate tables for sizing the distribution lines.
04.020 Select the proper size for the distribution line(s) (using the appropriate table(s)).
04.021 Locate the forms and sketches used by your company to plan a vapor distribution line.
04.022 Plan the routing for the distribution lines in an installation that includes: outside lines; lines passing through outside walls; lines passing through inside walls, ceilings, and floors; and inside lines.
04.023 Select the materials, fittings, and special protection needed for: outside lines; lines passing through outside walls; inside lines; and lines passing through inside walls, ceilings, and floors.
04.024 Determine the proper lengths of pipe between various types of fittings.
04.025 Plan a liquid distribution line.
04.026 Make a rough sketch of the installation for a liquid distribution line.
04.027 Determine the required flow rate for the liquid distribution line.
04.028 Calculate an average flow resistance for the valves and fittings in the liquid distribution line.
04.029 Based on the average flow resistance for the valves and fittings, select a "trial" pipe size for the distribution line.
04.030 Based on the "trial" pipe size, determine the exact flow resistance for the distribution line.
04.031 Select the proper regulator(s) for a typical installation.
04.032 Select any necessary accessories needed for the regulator.
04.033 Select the required materials needed to install the regulator.
04.034 Select a mounting bracket and any other materials to firmly support the regulator.
04.035 Install the regulator mounting bracket and post.
04.036 Install the regulator and supply manifold into the distribution line.
04.037 Install any required regulator accessories.
04.038 Plan an outdoor and indoor distribution system.
04.039 Install the outside distribution system.
04.040 Install the outside wall penetration line.
04.041 Install the inside distribution lines.
04.042 Install all inside floor or wall penetration lines and gas outlets.
04.043 Pressure test the distribution system to be sure that it is gas tight.
04.044 Purge the air (or inert gas) from the distribution line.
04.045 State the types of inspections that you should perform in a vapor distribution system.
04.046 State the types of repairs that you may have to perform in a vapor distribution system.
04.047 Use a troubleshooting guide to locate and correct problems in a vapor distribution system.
04.048 Identify the major parts of a diaphragm vapor meter.
04.049 Explain the basic operation of a diaphragm vapor meter.
04.050 Read the two most common types of meter indexes.
04.051 Explain the effects of temperature and pressure on meter accuracy.
04.052 Select and size a meter for an LP-gas vapor distribution system.
04.053 Select a location for installing a vapor meter.
04.054 Select a vapor meter for the installation.
04.055 Select the materials and accessories needed to install the vapor meter.
04.056 Prepare the vapor meter for installation.
04.057 Install any required mounting hardware.
04.058 Place the meter into service.
04.059 Determine the purpose and major parts of a vaporizer.
04.060 Explain the basic operation of a vaporizer.

04.061 Select the correct vaporizer for a particular installation from a manufacturer's catalog.
04.062 Install a vaporizer system.
04.063 Perform a service check on a vaporizer system.

05.0 DEMONSTRATE A PROFICIENCY IN LP-GAS LIQUID TRANSFER SYSTEMS AND EQUIPMENT--The student will be able to:

05.001 Name the types of pumps used in LP-gas service.
05.002 Identify the parts of LP-gas pumps and explain their purpose.
05.003 Explain the principles of efficient pump operation and the major factors that affect pump performance.
05.004 Properly size and select a pump to replace existing equipment.
05.005 Identify common pump protective devices such as strainers, flexible connectors, hydrostatic relief valves, and pump bypass valves.
05.006 Explain the design and operation of internal safety relief valves, differential pressure valves, and manual and automatic bypass circuits.
05.007 Explain the criteria for sizing, installing, and inspecting pump protective devices.
05.008 Explain the structure and function of the various parts of LP-gas meters, including the measuring chamber, gear train, temperature compensator, and register.
05.009 Explain the structure and operation of strainers, vapor eliminators, differential valves, and other metering system components.
05.010 Explain the criteria for sizing, selecting, and installing LP-gas metering systems.
05.011 Explain the inspection and maintenance requirements for LP-gas meters and metering systems, including the requirements for periodic testing and recalibration.
05.012 Explain the structure and operation of the various parts of LP-gas compressors, including the cooling and lubrication systems, drive system, and valve and piston assemblies.
05.013 Explain the structure and function of the inlet strainer, liquid trap, and other compressor protection devices.
05.014 Explain the structure and function of manifold valving, four-way valves, and other components that control the flow of liquid and vapor during compressor operations.
05.015 Explain the criteria for sizing and selecting LP-gas compressors and compressor drive systems.
05.016 Explain the operating parameters and inspection and maintenance requirements for LP-gas compressors and compressor transfer systems.
05.017 Identify and explain the operation of the different types of manual shutoff valves.
05.018 Identify and explain the operation of transfer line automatic check valves.
05.019 Identify various flow indicators in the transfer network.
05.020 Explain the proper maintenance procedures for shutoff valves, automatic check valves, and flow indicators.
05.021 Order replacement parts for manual shutoff valves and automatic check valves.
05.022 Explain the function and operation of the different types of withdrawal valves.
05.023 Identify the major components of withdrawal valves.
05.024 Explain the proper maintenance procedures for withdrawal valves.
05.025 Order replacement parts for withdrawal valves.
05.026 Identify the type of hose used in LP-gas transfer networks.
05.027 Identify the major component parts of hose reels and hose assemblies, including hose fittings, hose end valves, and hose end valve adaptors.
05.028 Perform routine inspections and maintenance of hose assemblies and related LP-gas equipment.
05.029 Properly size and select replacement hoses, hose end valves, and other related equipment.
05.030 Identify the types of cylinder filling equipment.
05.031 Identify the major components of the various cylinder filling stations.
05.032 Inspect filling systems for problems and defects.

05.033 Explain the proper maintenance procedures for cylinder filling equipment.
05.034 Order replacement parts for cylinder filling equipment.
05.035 Identify and discuss the shear fittings and various components of bulkheads installed at your facility.
05.036 Identify and explain the operation of emergency shutoff valves installed at your facility.
05.037 Identify and explain the operation of the remote closure devices, both manual and automatic, installed at your facility.
05.038 Order spare parts for the bulkheads and emergency shutoff valves installed at your facility.
05.039 Perform maintenance on the bulkheads and emergency shutoff valves installed at your facility.
05.040 Establish and conduct routine inspection procedures.
05.041 Identify potential problems in the transfer system.
05.042 Identify potential safety hazards in transfer system.
05.043 Perform preventative maintenance procedures.
05.044 Explain the general guidelines for ensuring good pump performance.
05.045 Explain the major causes of pump trouble and recognize their symptoms.
05.046 Use a troubleshooting chart and pressure gauges to locate and correct problems in pumping and metered delivery systems.
05.047 Explain the major causes of meter trouble and recognize their symptoms.
05.048 Use a troubleshooting chart to locate and correct meter problems.
05.049 Explain the general guidelines for ensuring efficient compressor operation.
05.050 Explain the major causes of compressor trouble and recognize their symptoms.
05.051 Use a troubleshooting chart and available instrumentation to locate and correct problems in compressor systems.
05.052 Properly isolate in a transfer line the LP-gas equipment that is in need of repair.
05.053 Safely bleed down and purge the LP-gas in the isolated equipment.
05.054 Properly remove and service a strainer, a valve, and other items of LP-gas equipment.
05.055 Safely reinstall the LP-gas equipment in the transfer line.
05.056 Test the transfer system for leaks and return it to service.

06.0 DEMONSTRATE A PROFICIENCY IN USING LP-GAS AS A MOTOR FUEL--The student will be able to:

06.001 Review the history of LP-gas as a motor fuel .
06.002 Explain the basic physical properties of LP-gas.
06.003 Compare the fuel characteristics of LP-gas with gasoline and diesel fuel.
06.004 Explain how the use of LP-gas in an internal combustion engine affects performance, fuel economy, emissions, and engine maintenance.
06.005 Explain why it is important to inspect an engine prior to converting it to run on propane, and what items to check.
06.006 Explain how LP-gas affects the valves, and what modifications may be needed to minimize valve wear for certain applications.
06.007 Explain how piston ring seating is affected by LP-gas, and how to deal with the question of breaking in a new or rebuilt engine.
06.008 Explain why the engine's compression ratio is important, and the bearing it has on performance.
06.009 Explain how engine and intake manifold cooling affect performance when using LP-gas, and why some modification may or may not be needed.
06.010 Explain why it is important to inspect the ignition system, how to check its performance, and how to upgrade it where necessary.
06.011 Explain how ignition timing and advance should be modified for LP-gas.
06.012 Explain what changes to the spark plugs may be necessary and how to "read" the plugs.
06.013 List by name the main components of an LP-gas fuel system, and be able to explain what each component does.
06.014 Explain the basic differences between straight and dual-fuel propane conversion.
06.015 Describe basic fuel tank design.
06.016 Describe the various fuel tank safety features.

07.016 Determine the defective status of fans.
07.017 Troubleshoot fans.
07.018 Remove and replace fans or components.
07.019 Determine the defective status of rollers/glides.
07.020 Troubleshoot rollers/glides.
07.021 Remove and replace rollers/glides or components.
07.022 Determine the defective status of seals.
07.023 Troubleshoot seals.
07.024 Remove and replace seals or components.
07.025 Determine the defective status of buzzers.
07.026 Troubleshoot buzzers.
07.027 Remove and replace buzzers or components.
07.028 Determine the defective status of clock/timers.
07.029 Troubleshoot clock/timers.
07.030 Remove and replace clock/timers or components.
07.031 Determine the defective status of drive motors.
07.032 Troubleshoot drive motors.
07.033 Remove and replace drive motors or components.
07.034 Determine the defective status of electronic igniters.
07.035 Troubleshoot electronic igniters.
07.036 Remove and replace electronic igniters or components.
07.037 Determine the defective status of self-clean relays.
07.038 Troubleshoot self-clean relays.
07.039 Remove and replace self-clean relays or components.
07.040 Determine the defective status of door switches.
07.041 Troubleshoot door switches.
07.042 Remove and replace door switches or components.
07.043 Determine the defective status of light switches.
07.044 Troubleshoot light switches.
07.045 Remove and replace light switches or components.
07.046 Determine the defective status of motor switches.
07.047 Troubleshoot motor switches.
07.048 Remove and replace motor switches or components.
07.049 Determine the defective status of selector switches.
07.050 Troubleshoot selector switches.
07.051 Remove and replace selector switches or components.
07.052 Determine the defective status of sensors.
07.053 Troubleshoot sensors.
07.054 Remove and replace sensors or components.
07.055 Determine the defective status of filters.
07.056 Troubleshoot filters.
07.057 Remove and replace filters or components.
07.058 Determine the defective status of gas valves oven burners.
07.059 Troubleshoot gas valves oven burners.
07.060 Remove and replace gas valves oven burners or components.
07.061 Determine the defective status of standing pilots.
07.062 Troubleshoot standing pilots.
07.063 Remove and replace standing pilots or components.
07.064 Determine the defective status of pressure regulators.
07.065 Troubleshoot pressure regulators.
07.066 Remove and replace pressure regulators or components.
07.067 Determine the defective status of safety valves.
07.068 Troubleshoot safety valves.
07.069 Remove and replace safety valves or components.
07.070 Determine the defective status of gas valves surface burners.
07.071 Troubleshoot gas valves surface burners.
07.072 Remove and replace gas valves surface burners or components.
07.073 Determine the defective status of thermocouplers.
07.074 Troubleshoot thermocouplers.
07.075 Remove and replace thermocouplers or components.
07.076 Determine the defective status of thermostats.
07.077 Troubleshoot thermostats.
07.078 Remove and replace thermostats or components.

08.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS--The student will be able to:

08.001 Conduct a job search.
08.002 Secure information about a job.
08.003 Identify documents that may be required when applying for a job.
08.004 Complete a job application form correctly.

08.005 Demonstrate competence in job interview techniques.
08.006 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
08.007 Identify acceptable work habits.
08.008 Demonstrate acceptable employee health habits.

09.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

09.001 Define entrepreneurship.
09.002 Describe the importance of entrepreneurship to the American economy.
09.003 List the advantages and disadvantages of business ownership.
09.004 Identify the risks involved in ownership of a business.
09.005 Identify the necessary personal characteristics of a successful entrepreneur.
09.006 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Gasoline Engine Mechanics

CODE NUMBER: Secondary ________ Postsecondary SER0990

Florida CIP IN47.060600

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ____________

APPLICABLE LEVELS(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 13-17

CERTIFICATION COVERAGE: GASENG RPR 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as gas engine repairers (625.281-026), small engine mechanics (625.281-034), power saw mechanics (625.281-030), motorcycle mechanics (620.281-054), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, basic math skills, reading service manuals, microfiche use, parts catalogs, hand tools, power tools, overhaul tools, acetylene torch operation, and servicing and reconditioning engines. The content also includes troubleshooting and repairing ignition, electrical charging, fuel, power transfer, cooling, exhaust, and starting systems; governors and speed controls; lubrication systems; starting systems; and basic management principles.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in tools, test equipment, and materials. Processes used in the laboratory should be similar to those used in industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communications, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 contact hours (2160 clock hours).

IV. INTENDED OUTCOMES: After sucessfully completing this program, the individual will be able to:

01. Demonstrate proficiency in performing laboratory operations to industry standards.

02. Demonstrate proficiency in applying customer service skills.
03. Demonstrate proficiency in applying basic mathematics skills.
04. Demonstrate proficiency in repairing and maintaining basic 2-stroke cycle engines.
05. Demonstrate proficiency in repairing and maintaining basic 4-stroke cycle engines.
06. Demonstrate proficiency in repairing and maintaining engine systems.
07. Demonstrate proficiency in repairing engine interior components.
08. Demonstrate proficiency in diagnosing and repairing power transfer systems.
09. Demonstrate proficiency in applying technical recording and reporting skills.
10. Demonstrate proficiency in servicing, repairing, and adjusting specific types of engines (optional electives).
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Gasoline Engine Mechanics POSTSECONDARY NUMBER: SER0990

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING LABORATORY OPERATIONS TO INDUSTRY STANDARDS--The student will be able to:

01.01 **Apply Safety Rules and Procedures**
01.02 Practice shop safety rules and procedures
01.03 Practice personal safety rules and procedures
01.04 Practice fire safety rules and procedures
01.05 Practice electrical safety rules and procedures
01.06 Practice air tools safety rules and procedures
01.07 Maintain a clean engine repair shop
01.08 **Use Laboratory Tools and Equipment**
01.09 Use general hand tools
01.10 Use special hand tools
01.11 Use precision measuring tools
01.12 Use power tools
01.13 Operate acetylene torches
01.14 Use fasteners
01.15 Use gaskets and choose sealants
01.16 Operate arc welding equipment

02.0 DEMONSTRATE PROFICIENCY IN APPLYING CUSTOMER SERVICE SKILLS --The student will be able to:

02.01 Prepare service orders properly
02.02 Listen to and interpret customer complaints to reduce repair time
02.03 Apply 2- and 4-cycle internal combustion theory or basic turboengine theory (as appropriate) to isolate problems
02.04 Communicate solutions to customers
02.05 Locate engine models and types
02.06 Prepare cost estimates
02.07 Follow manufacturers' service manuals
02.08 Locate parts in a parts catalog or on microfiche
02.09 Complete service or work orders including any warranty information required by the manufacturer

03.0 DEMONSTRATE PROFICIENCY IN APPLYING BASIC MATHEMATICS SKILLS --The student will be able to:

03.01 Read and interpret measuring devices (rules and tapes)
03.02 Add 100 addition combinations
03.03 Add two-digit numbers
03.04 Add three-digit numbers
03.05 Subtract 100 subtraction combinations
03.06 Subtract two-, three-, and four-digit numbers
03.07 Solve one-digit divisor problems
03.08 Solve two-digit divisor problems
03.09 Solve two- and three-digit divisor problems
03.10 Solve multiplication facts
03.11 Multiply by a one-digit factor
03.12 Multiply by a two-digit factor
03.13 Identify the parts of a fraction
03.14 Identify fractional parts
03.15 Solve fractional word problems
03.16 Classify types of fractions
03.17 Illustrate equivalent fractions
03.18 Convert fractions
03.19 Reduce fractions
03.20 Solve decimal notations
03.21 Solve number word problems
03.22 Round to the nearest whole number
03.23 Add decimals
03.24 Subtract decimals
03.25 Multiply decimals
03.26 Divide a decimal by a decimal
03.27 Divide a whole number by a decimal
03.28 Write fractions as decimals and percents
03.29 Write percents as fractions and decimals
03.30 Solve percent problems

03.31 Find the percent of a number
03.32 Operate simple hand-held calculators
03.33 Understand and use the metric system
03.34 Convert inches to millimeters and millimeters to inches

04.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC 2-STROKE CYCLE ENGINES--The student will be able to:

04.01 Explain the basic principles of the operation of the 2-stroke cycle internal combustion engine
04.02 Identify types of engines
04.03 Locate engine serial and model numbers
04.04 Identify engine assemblies and systems
04.05 Disassemble engines
04.06 Remove, clean, and inspect the head for cracks, warpage, and damaged spark plug threads
04.07 Diagnose head problems by use of the visual inspection method
04.08 Diagnose head problems by use of the compression tester method
04.09 Diagnose head problems by use of the cylinder air pressure method
04.10 Remove, clean, and inspect piston rods and assemblies
04.11 Measure out-of-round piston and cylinder
04.12 Hone cylinders
04.13 Check the total bearing surface of connecting rod bearings
04.14 Measure piston skirts and ring grooves
04.15 Measure the piston-ring gap in the cylinder bore
04.16 Install piston pins according to manufacturer's specifications
04.17 Check rod and piston assembly alignment
04.18 Install rings on pistons
04.19 Install piston rod assemblies
04.20 Measure and check crankshafts with a micrometer to diagnose engine problems
04.21 Check needle bearings
04.22 Inspect crankshafts and install seals
04.23 Inspect, clean, and/or replace reed valves
04.24 Reassemble engines

05.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC 4-STROKE CYCLE ENGINES--The student will be able to:

05.01 Explain the basic principles of the operation of the 4-stroke cycle internal combustion engine
05.02 Identify types of 4-stroke cycle engines
05.03 Locate engine serial and model numbers
05.04 Identify engine assemblies and systems
05.05 Diagnose valve and head problems by use of the visual inspection method, i.e., water contamination vs. fuel-rich or -lean carburetor adjustment
05.06 Diagnose valve and head problems by use of the compression tester method
05.07 Diagnose valve and head problems by use of the cylinder air pressure method
05.08 Diagnose valve and head problems by use of the stethoscope method
05.09 Disassemble engines
05.10 Clean and inspect heads for cracks, warpage, and damaged spark plug threads
05.11 Inspect valves for warpage, burns, cracks, stem wear, tip wear, and margin
05.12 Grind valve seats and reface valves
05.13 Check and inspect springs for free height, distortion, and installed height
05.14 Adjust valve lash
05.15 Remove and inspect camshafts and lifters (ONAN engines)
05.16 Measure camshafts (ONAN and KOHLER engines)
05.17 Service camshaft bearings (ONAN engines)
05.18 Clean and inspect lifters for wear (ONAN engines)
05.19 Time valve drive assemblies
05.20 Remove piston from rods assemblies
05.21 Measure out-of-round and cylinder taper with a dial bore gauge or micrometer
05.22 Check piston pins and bosses for wear
05.23 Measure piston ring lands width, out-of-round, and taper
05.24 Measure the piston-ring gap in the cylinder bore
05.25 Install and fit piston pins

05.26 Check rod and piston assembly alignment
05.27 Remove and replace rod bearings
05.28 Hone and clean cylinders
05.29 Install rings on pistons
05.30 Measure and check crankshafts with a micrometer
05.31 Check for end play
05.32 Check the bearing bore with a telescoping gauge using special tools provided by the engine manufacturer
05.33 Reassemble engines
05.34 Install oil seals

06.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING ENGINE SYSTEMS --The student will be able to:

06.01 **Diagnose and Repair Ignition Systems**
06.02 Identify and diagnose ignition systems and components
06.03 Diagnose and repair magneto ignition systems
06.04 Diagnose and repair solid-state ignition systems
06.05 Diagnose and repair battery ignition systems
06.06 Diagnose and repair impulse ignition systems
06.07 Identify spark plugs and special applications
06.08 Remove, adjust, and replace spark plugs
06.09 Adjust ignition system timing
06.10 **Service Fuel Systems**
06.11 Service air filters
06.12 Service or replace fuel filters
06.13 Service and repair suction-type carburetors
06.14 Service and repair diaphragm-type carburetors
06.15 Service and repair float-type carburetors
06.16 Remove and service fuel supply systems
06.17 Determine and use correct fuel and fuel mixtures
06.18 **Service, Repair, and Adjust Engine Controls**
06.19 Service, repair, and adjust governor speed controls
06.20 Service, repair, and adjust remote speed controls
06.21 Service, repair, and adjust manual start-stop controls
06.22 Service, repair, and adjust electrical start-stop controls
06.23 Service, repair, and adjust zone systems
06.24 Service, repair, and adjust blade-clutch controls
06.25 Service, repair, and adjust chain brake systems
06.26 Comply with the Consumer Protection Act (CPA) for three-second stops
06.27 Comply with the CPA for interlocks
06.28 Comply with the CPA for blade-tip speed
06.29 Read and interpret CPA rules and regulations
06.30 **Repair and Service Lubrication Systems**
06.31 Select proper oil grades/types
06.32 Repair and service lubrication systems
06.33 Service crankcase breathers
06.34 Replace seals and gaskets
06.35 Identify oil grade terms
06.36 Identify lubrication systems
06.37 Identify, understand, and relate types and ratios of 2-cycle mix oils and their relationship to specific pieces of equipment
06.38 **Service Cooling and Exhaust Systems**
06.39 Service air cooling fins and screens
06.40 Service 2-cycle exhaust systems
06.41 Service 4-cycle exhaust systems
06.42 **Diagnose, Service, Repair, and Adjust Electrical Systems**
06.43 Operate electrical testing instruments
06.44 Diagnose and replace electrical-system components
06.45 Test and service batteries according to manufacturers' requirements and the use of the battery (i.e., motorcycle batteries require a trickle charge at 1.5 amps over a period of 8 hours)
06.46 Service, repair, and adjust charging systems
06.47 **Service and Repair Starting Systems**
06.48 Service and repair manual starting systems
06.49 Service and repair electrical starting systems
06.50 Test and service battery starting systems

07.0 DEMONSTRATE PROFICIENCY IN REPAIRING ENGINE INTERIOR COMPONENTS --The student will be able to:

- 07.01 Service, repair, and adjust valve systems
- 07.02 Service, repair, and adjust rings, bores, and pistons
- 07.03 Service, repair, and adjust crankshafts and bearings
- 07.04 Service, repair, and adjust rods
- 07.05 Service, repair, and adjust lubrication systems
- 07.06 Service, repair, and adjust internal governor
- 07.07 Service, repair, and adjust internal components timing
- 07.08 Assemble complete engines to manufacturer's specifications
- 07.09 Diagnose causes of component failures to determine if they are due to friction, resulting from poor lubrication or contaminated fuel, or to normal wear

08.0 DEMONSTRATE PROFICIENCY IN DIAGNOSING AND REPAIRING POWER TRANSFER SYSTEMS--The student will be able to:

- 08.01 Inspect and measure belts and chains
- 08.02 Install belts and chains
- 08.03 Diagnose and repair manual transmissions
- 08.04 Diagnose and repair differentials
- 08.05 Identify power transfer system components
- 08.06 Diagnose and replace drive components
- 08.07 Remove and repair clutches
- 08.08 Sharpen and balance blades
- 08.09 Remove and replace or install blades correctly
- 08.10 Remove and replace hydraulic pump systems

09.0 DEMONSTRATE PROFICIENCY IN APPLYING TECHNICAL RECORDING AND REPORTING SKILLS--The student will be able to:

- 09.01 Draw and interpret electrical, electronic, hydraulic, and mechanic schematics
- 09.02 Write reports
- 09.03 Maintain test logs
- 09.04 Make equipment failure reports
- 09.05 Specify and requisition components
- 09.06 Compose technical letters
- 09.07 Write formal reports of laboratory experiences

10.0 DEMONSTRATE PROFICIENCY IN SERVICING, REPAIRING, AND ADJUSTING SPECIFIC TYPES OF ENGINES (ELECTIVE OPTIONS)--The student will be able to:

- 10.01 Service, repair, and adjust lawn and garden equipment
- 10.02 Service, repair, and adjust commercial golf course equipment
- 10.03 Service, repair, and adjust commercial industrial equipment

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

- 11.01 Conduct a job search
- 11.02 Secure information about a job
- 11.03 Identify documents that may be required when applying for a job
- 11.04 Complete a job application form correctly
- 11.05 Demonstrate competence in job interview techniques
- 11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
- 11.07 Identify acceptable work habits
- 11.08 Demonstrate knowledge of how to make job changes appropriately
- 11.09 Demonstrate acceptable employee health habits

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

- 12.01 Define entrepreneurship
- 12.02 Describe the importance of entrepreneurship to the American economy
- 12.03 List the advantages and disadvantages of business ownership
- 12.04 Identify the risks involved in ownership of a business
- 12.05 Identify the necessary personal characteristics of a successful entrepreneur
- 12.06 Identify the business skills needed to operate a small business efficiently and effectively

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: General Drafting

CODE NUMBER: Secondary 8724000 Postsecondary ______

Florida CIP IN48.010100

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

____ Postsecondary Vocational x Other 10-12, 21

CERTIFICATION COVERAGE: DRAFTING 7 TEC DRAFT @ 7
TEC CONSTR @ 7 BLDG CONST @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as blueprint machine operators (979.682-014), drafters, assistant (017.281-018), or detailers (017.261-018).

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, blueprint machine operation, use of drafting tools and equipment, drafting skills, charts and graphs, computer aided drawings, and technical mathematics.

Listed below are the courses that comprise this program when offered at the secondary level:

8724010	General Drafting 1
8724020	General Drafting 2
8724030	General Drafting 3
8724040	General Drafting 4
8724050	General Drafting 5
8724060	General Drafting 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in drafting machines, drafting tools, CAD systems, drafting tracks, blueprint machine materials/supplies common to the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

Approximately 25% (250Hrs) shall be spent utilizing CAD systems.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of orientation information.
02. Apply basic drafting skills.
03. Solve technical mathematical problems.
04. Prepare multi-view drawings.
05. Prepare sectional views.
06. Prepare auxiliary drawings.
07. Apply basic dimensioning.
08. Prepare pictorial drawings.
09. Prepare surface developments.
10. Utilize drafting applications.
11. Prepare basic charts and graphs.
12. Prepare basic computer aided drawings.
13. Demonstrate employability skills.
14. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
PROGRAM AREA: Industrial
PROGRAM TITLE: General Drafting

EFFECTIVE DATE: July, 1987
SECONDARY NUMBER: 8724000
POSTSECONDARY NUMBER: __________

01.0 DEMONSTRATE KNOWLEDGE OF ORIENTATION INFORMATION--The student will be able to:

01.01 Identify school, classroom and grading policies.
01.02 Apply safety practices.
01.03 Identify drafting careers and occupational concepts.
01.04 Identify course overview.
01.05 Locate resource materials and audio-visual training equipment.
01.06 Use reproduction equipment i.e., blueprint machines and office copy equipment.

02.0 APPLY BASIC DRAFTING SKILLS--The student will be able to:

02.01 Use drafting equipment, measuring scales, drawing media, drafting instruments and consumable materials.
02.02 Use conversion tables for fractions, decimals and metric measurements.
02.03 Identify the use of the alphabet of lines.
02.04 Prepare title blocks and other drafting formats.
02.05 Use various freehand and other lettering techniques.
02.06 Apply geometric, oblique and prospective sketches.
02.07 Prepare axonometric, oblique and prospective sketches.
02.08 Interpret reports and specifications.

03.0 SOLVE TECHNICAL MATHEMATICAL PROBLEMS--The student will be able to:

03.01 Solve arithmetic problems.
03.02 Solve algebra problems.
03.03 Solve trigonometric problems.
03.04 Solve geometry problems.
03.05 Apply multiple discipline calculations.

04.0 PREPARE MULTI-VIEW DRAWINGS--The student will be able to:

04.01 Select proper drawing scale, views and layout.
04.02 Prepare drawings containing horizontal and vertical surfaces.
04.03 Prepare drawings containing circles and/or arcs.
04.04 Prepare drawings containing incline surfaces.
04.05 Prepare drawings incorporating partial views.
04.06 Prepare drawings incorporating removed details and conventional breaks.

05.0 PREPARE SECTIONAL VIEWS--The student will be able to:

05.01 Prepare drawings containing full sections and half sections.
05.02 Prepare drawings containing offset sections.
05.03 Prepare drawings containing revolved sections.
05.04 Prepare drawings containing removed sections and broken-out sections.
05.05 Use conventional representation.
05.06 Prepare a sectional-assembly drawing applying material symbols.

06.0 PREPARE AUXILIARY DRAWINGS--The student will be able to:

06.01 Prepare drawings containing primary auxiliary views.
06.02 Prepare drawings containing auxiliary views that include curved lines.
06.03 Prepare drawings containing auxiliary sections.
06.04 Prepare drawings containing secondary auxiliary view.

07.0 APPLY BASIC DIMENSIONING--The student will be able to:

07.01 Prepare drawings containing linear standard dimensions.
07.02 Prepare drawings that include angular standard dimensions.
07.03 Prepare drawings include circular standard dimensions.
07.04 Prepare drawings using metric dimensions.
07.05 Prepare drawings using general and local notes.
07.06 Prepare drawings using surface characteristic notations.

08.0 PREPARE PICTORIAL DRAWINGS--The student will be able to:

08.01 Prepare isometric drawings.
08.02 Prepare dimetric drawings.
08.03 Prepare cavalier drawings.
08.04 Prepare cabinet drawings.
08.05 Prepare one and two point perspectives.

09.0 PREPARE SURFACE DEVELOPMENTS--The student will be able to:

09.01 Prepare drawings with sketchouts of prisms, cylinders, cones and pyramids.
09.02 Prepare sketchouts of a transition piece.
09.03 Prepare drawings involving intersecting pieces.

10.0 UTILIZE DRAFTING APPLICATIONS--The student will be able to:

10.01 Identify and use the various drafting and graphic appliques.
10.02 Use cut and paste techniques.
10.03 Identify and use photo techniques.
10.04 Prepare overlay drawings.
10.05 Make drawing changes on a sepia.
10.06 Apply inking techniques.

11.0 PREPARE BASIC CHARTS AND GRAPHS--The student will be able to:

11.01 Prepare bar, pie, and flow charts.
11.02 Prepare rectangular and semi-logarithmic graphs.

12.0 PREPARE BASIC COMPUTER AIDED DRAWINGS--The student will be able to:

12.01 Use full size standard keyboard.
12.02 Use dual disc drive console.
12.03 Use monitor.
12.04 Use digitizer.
12.05 Use plotter (single and multipen).
12.06 Format, transfer and operate diskette.
12.07 Produce multi-view drawings with dimensions.
12.08 Produce section view drawings with dimensions.
12.09 Produce auxiliary view drawings with dimensions.
12.10 Produce pictorial drawings.
12.11 Produce charts and graphs.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

13.01 Conduct a job search.
13.02 Secure information about a job.
13.03 Identify documents which may be required when applying for a job interview.
13.04 Complete a job application form correctly.
13.05 Demonstrate competence in job interview techniques.
13.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
13.07 Identify acceptable work habits.
13.08 Demonstrate knowledge of how to make job changes appropriately.
13.09 Demonstrate acceptable employee health habits.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship.
14.02 Describe the importance of entrepreneurship to the American economy.
14.03 List the advantages and disadvantages of business ownership.
14.04 Identify the risks involved in ownership of a business.
14.05 Identify the necessary personal characteristics of a successful entrepreneur.
14.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
PROGRAM AREA: Industrial
PROGRAM TITLE: General Drafting
COURSE TITLE: General Drafting 1

EFFECTIVE DATE: July, 1987
COURSE CREDIT: 1
PROGRAM NUMBER: 8724000
COURSE NUMBER: 8724010

COURSE DESCRIPTION:

This course is designed to provide instruction in safe and efficient work practices, course overview, use and care of tools and equipment, technical terms and techniques, and basic shape construction.

01.0 DEMONSTRATE KNOWLEDGE OF ORIENTATION INFORMATION--The student will be able to:

01.01 Identify school, classroom and grading policies.
01.02 Apply safety practices.
01.03 Identify drafting careers and occupational concepts.
01.04 Identify course overview.
01.05 Locate resource materials and audio-visual training equipment.
01.06 Use reproduction equipment i.e., blueprint machines and office copy equipment.

02.0 APPLY BASIC DRAFTING SKILLS--The student will be able to:

02.01 Use drafting equipment, measuring scales, drawing media, drafting instruments and consumable materials.
02 02 Use conversion tables for fractions, decimals and metric measurements.
02.03 Identify the use of the alphabet of lines.
02.04 Prepare title blocks and other drafting formats.
02.05 Use various freehand and other lettering techniques.
02.06 Apply geometric, oblique and prospective sketches.
02.07 Prepare axonometric, oblique and prospective sketches.
02.08 Interpret reports and specifications.

STUDENT PERFORMANCE STANDARDS
PROGRAM AREA: Industrial
PROGRAM TITLE: General Drafting
COURSE TITLE: General Drafting 2

EFFECTIVE DATE: July, 1987
COURSE CREDIT: 1
PROGRAM NUMBER: 8724000
COURSE NUMBER: 8724020

COURSE DESCRIPTION:

This course is designed to provide instruction in scale drawings, applied math, geometric drawings, multi-view orientation and visualization and dimensioning.

03.0 SOLVE TECHNICAL MATHEMATICAL PROBLEMS--The student will be able to:

03.01 Solve arithmetic problems.
03.02 Solve algebra problems.
03.03 Solve trigonometric problems.
03.04 Solve geometry problems.
03.05 Apply multiple discipline calculations.

04.0 PREPARE MULTI-VIEW DRAWINGS--The student will be able to:

04.01 Select proper drawing scale, views and layout.
04.02 Prepare drawings containing horizontal and vertical surfaces.
04.03 Prepare drawings containing circles and/or arcs.
04.04 Prepare drawings containing incline surfaces.
04.05 Prepare drawings incorporating partial views.
04.06 Prepare drawings incorporating removed details and conventional breaks.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: General Drafting — PROGRAM NUMBER: 8724000

COURSE TITLE: General Drafting 3 — COURSE NUMBER: 8724030

COURSE DESCRIPTION:

This course is designed to provide instruction in preparation of sectional view drawing, auxiliary views and dimensioning.

05.0 PREPARE SECTIONAL VIEWS--The student will be able to:

05.01 Prepare drawings containing full sections and half sections.
05.02 Prepare drawings containing offset sections.
05.03 Prepare drawings containing revolved sections.
05.04 Prepare drawings containing removed sections and broken-out sections.
05.05 Use conventional representation.
05.06 Prepare a sectional-assembly drawing applying material symbols.

06.0 PREPARE AUXILIARY DRAWINGS--The student will be able to:

06.01 Prepare drawings containing primary auxiliary views.
06.02 Prepare drawings containing auxiliary views that include curved lines.
06.03 Prepare drawings containing auxiliary sections.
06.04 Prepare drawings containing secondary auxiliary view.

07.0 APPLY BASIC DIMENSIONING--The student will be able to:

07.01 Prepare drawings containing linear standard dimensions.
07.02 Prepare drawings that include angular standard dimensions.
07.03 Prepare drawings include circular standard dimensions.
07.04 Prepare drawings using metric dimensions.
07.05 Prepare drawings using general and local notes.
07.06 Prepare drawings using surface characteristic notations.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: General Drafting — PROGRAM NUMBER: 8724000

COURSE TITLE: General Drafting 4 — COURSE NUMBER: 8724040

COURSE DESCRIPTION:

This course is designed to provide instruction in the preparation of pictorial drawing, and surface developments.

08.0 PREPARE PICTORIAL DRAWINGS--The student will be able to:

08.01 Prepare isometric drawings.
08.02 Prepare dimetric drawings.
08.03 Prepare cavalier drawings.
08.04 Prepare cabinet drawings.
08.05 Prepare one and two point perspectives.

09.0 PREPARE SURFACE DEVELOPMENTS--The student will be able to:

09.01 Prepare drawings with sketchouts of prisms, cylinders, cones and pyramids.
09.02 Prepare sketchouts of a transition piece.
09.03 Prepare drawings involving intersecting pieces.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: General Drafting
PROGRAM NUMBER: 8724000
COURSE TITLE: General Drafting 5
COURSE NUMBER: 8724050

COURSE DESCRIPTION:

This course is designed to provide instruction in graphic design, layout and paste up, overlay, charting and graph making.

10.0 UTILIZE DRAFTING APPLICATIONS--The student will be able to:

10.01 Identify and use the various drafting and graphic appliques.
10.02 Use cut and paste techniques.
10.03 Identify and use photo techniques.
10.04 Prepare overlay drawings.
10.05 Make drawing changes on a sepia.
10.06 Apply inking techniques.

11.0 PREPARE BASIC CHARTS AND GRAPHS--The student will be able to:

11.01 Prepare bar, pie, and flow charts.
11.02 Prepare rectangular and semi-logarithmic graphs.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: General Drafting
PROGRAM NUMBER: 8724000
COURSE TITLE: General Drafting 6
COURSE NUMBER: 8724060

COURSE DESCRIPTION:

This course is designed to provide instruction in the use of basic computer aided drawing, employability skills, and cooperative training.

12.0 PREPARE BASIC COMPUTER AIDED DRAWINGS--The student will be able to:

12.01 Use full size standard keyboard.
12.02 Use dual disc drive console.
12.03 Use monitor.
12.04 Use digitizer.
12.05 Use plotter (single and multipen).
12.06 Format, transfer and operate diskette.
12.07 Produce multi-view drawings with dimensions.
12.08 Produce section view drawings with dimensions.
12.09 Produce auxiliary view drawings with dimensions.
12.10 Produce pictorial drawings.
12.11 Produce charts and graphs.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

13.01 Conduct a job search.
13.02 Secure information about a job.
13.03 Identify documents which may be required when applying for a job interview.
13.04 Complete a job application form correctly.
13.05 Demonstrate competence in job interview techniques.
13.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
13.07 Identify acceptable work habits.
13.08 Demonstrate knowledge of how to make job changes appropriately.
13.09 Demonstrate acceptable employee health habits.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship.
14.02 Describe the importance of entrepreneurship to the American economy
14.03 List the advantages and disadvantages of business ownership.
14.04 Identify the risks involved in ownership of a business.
14.05 Identify the necessary personal characteristics of a successful entrepreneur.
14.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Glazing

CODE NUMBER: Secondary ______ Postsecondary BCT0499

Florida CIP IN46.040600

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-17

CERTIFICATION COVERAGE: TEC CONSTR @ 7 GLAZIER 7 BLDG CONST @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as glass installers (50141801), glaziers (50141802), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and installation and repair of all types of glass, plastic, and acrylic windows, walls, and panels.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in safe use of tools, equipment and materials, cutting and installation of glass, acrylics and plastics, and installation of doors, windows and hardware.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 450 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform mathematical calculations and estimate quantities of materials.
02. Read and interpret blueprints.
03. Cut and install glass, acrylics and plastics.
04. Identify, select and use glazing and caulking compounds.
05. Install doors, windows and hardware.
06. Replace broken or defective panels.
07. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS

GLAZING

01.0 PERFORM MATHEMATICAL CALCULATIONS AND ESTIMATE QUANTITIES OF MATERIALS — The student will be able to:

01.01 Measure frames with rules to determine size of panes needed.
01.02 Use measurement instruments and tools to determine dimensions
01.03 Develop material utilization and cost estimate for jobs.
01.04 Solve basic math problems.

02.0 READ AND INTERPRET BLUEPRINTS — The student will be able to:

02.01 Differentiate between various types of glass.
02.02 Identify parts of a building component using a blueprint.
02.03 Recognize commonly used symbols on blueprints and schematics.
02.04 Interpret blueprints and schematics
02.05 Perform job set up.
02.06 Lay out cutting lines on glass following specifications, and cut glass to shape.
02.07 Mark outline or pattern on glass.

03.0 CUT AND INSTALL GLASS, ACRYLICS AND PLASTICS — The student will be able to:

03.01 Store, handle and transport glass and materials safely.
03.02 Polish glass.
03.03 Tint glass.
03.04 Spray glass with tinting solution.
03.05 Coat glass.
03.06 Cut and install laminated safety glass in windows and windshields.
03.07 Install mirrors or structural glass using mastic, screws, or decorating molding.
03.08 Install glass in windows, skylights, store fronts, display cases, or on surfaces.
03.09 Apply edging to glass.
03.10 Grind and bevel edges of glass.
03.11 Scribe and cut glass with straight edge of glass cutter to specifications.
03.12 Break off excess glass by hand and notched tool.
03.13 Cut glass to fit window dimension.
03.14 Cut glass following pattern, using glasscutters.
03.15 Select and use proper tools and equipment for job.

04.0 IDENTIFY, SELECT AND USE GLAZING AND CAULKING COMPOUNDS — The student will be able to:

04.01 Install solar heat collector glass units.
04.02 Install glass and insert glazing points or wire clips using putty knife or spring machine.
04.03 Prepare putty for wood sash use.
04.04 Select proper type of materials.
04.05 Prepare putty for steel sash use.
04.06 Apply sealants and gasket materials as prescribed by manufacturers.
04.07 Spread and smooth putty around edges of panes with putty knife to seal joints.

05.0 INSTALL DOORS, WINDOWS AND HARDWARE — The student will be able to:

05.01 Install or replace screen and hardware wire.
05.02 Replace screen or metal screen frame.
05.03 Replace screen on wood screen frame.
05.04 Install or replace a window and casing in accordance with manufacturers specifications.
05.05 Select, measure, and cut metal or plastic moldings and members to required length in accordance in accordance with manfacturers specifications.
05.06 Install or replace a prehung door and casing in accordance with manufacturers specifications.
05.07 Install or replace door and/or window hardware in accordance with manufacturers specifications.
05.08 Drill holes in glass and mirrors.
05.09 Install airtight plate glass windows in refrigeration display cases and walk in coolers.
05.10 Install glass in doors or other openings in metal furniture using handtools and power tools.
05.11 Secure glass by fastening metal and insulating stripes around edges in accordance with manufacturers specifications.
05.12 Assemble and install metal framed glass enclosures for showers.
05.13 Install or replace stained glass windows in accordance with manufacturers specifications.
05.14 Install or replace metal window and door frames into which glass panels are to be fitted in accordance with manufacturers specfications.
05.15 Set glass doors into frame and fit hinges in accordance with manufacturers specifications.

05.16 Fasten hardware to glass doors in accordance with manufactuers specifications.
05.17 Fasten glass panes into wood sash with glaziers points.
05.18 Assemble platform and staging materials for high work.
05.19 Fasten and use safety lines and equipment.
05.20 Attach and use respirator when working with toxic materials.
05.21 Comply with safety regulations and procedures.

06.0 REPLACE BROKEN OR DEFECTIVE PANELS — The student will be able to:

06.01 Inspect glass for flaws, chips, scratches, or rough spots.
06.02 Remove old putty.
06.03 Remove broken glass with chisel, hacking knife or power tools.
06.04 Remove and replace glass in metal frame window.
06.05 Remove and replace glass in wood frame window.
06.06 Install or replace tempered plastic.
06.07 Install or replace thermo pane.
06.08 Remove and replace old or damaged glass.
06.09 Remove hardware and glass retainers.
06.10 Install or replace plate, safety, or wire glass.

07.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS — The student will be able to:

07.01 List sources of job opening other than public or private employment agencies.
07.02 Write a letter of application for a job.
07.03 Prepare a vita, resume or personal fact sheet.
07.04 List factors to consider when applying for a job.
07.05 List ways of making contact with employers.
07.06 Identify documents which may be required when applying for a job interview.
07.07 Complete a job application form correctly.
07.08 Identify appropriate dress and grooming for a job interview.
07.09 Classify behaviors considered appropriate or inappropriate in a job interview situation.
07.10 Describe advantage to employerr and employees of being a productive worker.
07.11 Explain the purpose of supervision, self discipline and performance evaluation.
07.12 Identify appropriate response(s) to criticism from employer, supervisor or other employees.
07.13 List consequences of being absent frequently from the job.
07.14 List consequences of frequently arriving late for work.
07.15 List factors to consider when resigning from a job.
07.16 Write a letter of resignation.

CURRICULUM FRAMEWORK
PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION
EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Graphic Arts Technology

CODE NUMBER: Secondary ___________ Postsecondary GRA0991

Florida CIP IN50.080100

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 13-15

CERTIFICATION COVERAGE: PRINTING 7 TEC CONSTR @ 7
TEC PROD @ 7 BLDG CONSTR @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment in a variety of occupational titles encompassing jobs in administration, pre-press, press, and post-press operations. More important, the program provides the student with the potential for advancement into supervision, middle management, and upper management positions in the printing industry leading to job titles such as foreman, supervisor, manager, plant manager, vice-president, president owner, executive, technical or customer service representative, quality control specialist, estimator, teacher, purchasing agent, and printing salesperson, and other related job titles, and to provide supplemental training for persons previously or currently employed in these occupations.

Graduates of this program will be employed in commercial print shops, publishing houses, in-plant print shops, newspapers, ad agencies, trade shops, paper houses and manufacturers, ink manufacturers and suppliers, graphic arts research and development foundations, suppliers of general graphic arts materials and machinery, manufacturers of graphic arts equipment, graphic arts trade associations, color separation houses, junior and senior high schools (as teachers), vocational-technical centers (as teachers), and community colleges (as teachers).

Graduates of this program will also be prepared for further specialized training and education in Commercial Art, Commercial Photography, Printing Management, Printing Production, Printing Education, Marketing Advertising, and other related technologies.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, administration, pre-press, press, and post-press operations.

The content should include a minimum of 225 contact hours (270 clock hours) in General Education (Communications, Humanities, Social Environment, Natural Environment, and Individual/Health Analysis); 525-600 contact hours (630-720 clock hours) in Graphic Arts training such as Technical Mathematics, Printing Management, Reproduction Processes, Principles of Typography, Copy Preparation, Stripping Black and White, Line Graphic Photo Processes, Offset Presswork, Estimating, Graphic Arts Halftone Processes, and Color Reproduction Technology; and 150-180 contact hours (180-216 clock hours) in approved electives such as Accounting, Business Law, Small Business Management, Supervisory Techniques, Graphic Arts, Microcomputers, Computer Programming, Chemistry, Physics, Advanced Mathematics, or other approved selected courses.

operating equipment, materials, and processes, similar to those used in the printing industry. Students should be able to use the various types of equipment found in general use throughout the printing industry for the purpose of producing customer layouts, composition, and camera ready copy; producing line negatives, halftone negatives, and contacts; stripping line negatives, halftone negatives, and multicolor and process color; producing printing plates, single color proofs, and color proofs; operating and adjusting duplicators; and operating cutting, folding, and binding equipment.

Laboratory activities are an integral and indispensable part of the total learning experience. Content becomes an avenue to apply scientific reasoning (logic) to: (1) the preparation of technical reports, (2) the organization of mental processes, material, people, funds, time, and other resources. Assigned projects begin with problem identification, object identification, fact gathering, analysis, synthesis, conclusions, evaluation of alternative, and decision-making or recommendations.

III. SPECIAL NOTE: Other related instruction which the student should be encouraged to take while enrolled in this program and which will enhance the student's opportunities in the printing industry include: Journalism, English, Literature, Algebra, Chemistry, Physics, Typing, Art, Computer Science, and Business related courses.

The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The Industrial Cooperative Education (ICE) method of instruction may be utilized for not more than 180 contact hours (216 clock hours) of this program. Whenever this cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills, and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of the technical part of this program for the average achieving student is approximately 600 contact hours (720 clock hours). It is suggested that, of the total program hours, approximately 450 contact hours (540 clock hours) be theoretical training and approximately 150 contact hours (180 clock hours) be hands-on laboratory experiences. Students who have completed Printing Programs in High Schools or Printing and Graphic Arts Programs in Vocational Technical Centers should be encou aged to enroll in the Graphic Arts Technology Program. Articulation agreements should permit the student to enter the Graphic Arts Technology Program with advanced standing if the student is given credit for knowledge, skill, and ability gained in his or her previous training and if he or she is not required to repeat those previously mastered competencie

The typical length of the entire program for the average achieving student is 900 contact hours (1080 clock hours).

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform reproduction process operations.
02. Perform estimating operations.
03. Perform graphic design operations.
04. Perform typographical operations.
05. Perform copy preparation operations.
06. Perform line graphic photo operations.

07. Perform graphic arts halftone operations.
08. Perform color reproduction operations.
09. Perform stripping operations.
10. Perform proofing & platemaking operations.
11. Perform offset operations.
12. Perform finishing operations.
13. Demonstrate employability skills.
14. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTVIVE DATE: July 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: __________

PROGRAM TITLE: Graphic Arts Technology POSTSECONDARY NUMBER: GRA0991

01.0 PERFORM REPRODUCTION PROCESS OPERATIONS--The student will be able to:

01.01 Identify the equipment & materials used in reproduction process operations, their parts & functions, & the safety rules relating to their operation.
01.02 Set up & operate reproduction tools & equipment.
01.03 Perform operator maintenance on reproduction equipment.
01.04 Identify & explain the scope, purpose, size, & products of the graphic communications industry by identifying various statistics that relate to its existence.
01.05 Trace the evolution of writing, kinds of communications, materials used, & printing by identifying & recalling times, cultures, & specific inventions.
01.06 Analyze the various reproduction processing such as: letterpress, gravure, offset lithography, screen, flexography, & electronic.
01.07 Compare & contrast the various reproduction of elements in each reproduction process to distinguish the strengths & weaknesses of each.
01.08 Explain the value of planning & design to the graphic communication process by identifying principles of design and the steps used in the planning of layouts.
01.09 Analyze the various printing surfaces by contrast & comparison to a variety of elements in each process to distinguish the difference in each surface.
01.10 Evaluate printing processes by judging advantages & disadvantages of each.
01.11 Define terms used in mark-up of copy for composition by being able to recognize marks, instructions, & other data.
01.12 Place in sequential order the production steps of a printing job from conception to completion.
01.13 Define terms used in making a paste-up or mechanical.
01.14 Define & explain the elements of typography and their value to the printing & design process.
01.15 Analyze typographic terms.
01.16 Analyze the current systems of composition by comparison & contrast & by being ableto categorize & distinguish each.
01.17 Define & explain ther terms & methodology used in commercial & process photography as they relate to the printing processes.
01.18 Analyze plates used in the various printing processes.
01.19 Define & explain the principles & generalizations in the use of color in design of printing.
01.20 Define & explain the history of inks, substrates, & differences between printing processes.
01.21 Define & explain the history of paper & basic components in paper by recalling items used in place of paper and identifying the steps used in the manufacture of paper.
01.22 List & explain career opportunities in printing.
01.23 Analyze the difference between artist use and production use of printing.
01.24 Set up & operate machine used in reproduction process operation in accordance with manufacturer's specifications.
01.25 Perform operator maintenance on machine used in reproduction process operation in accordance with manufacturer's specifications.

02.0 PERFORMING ESTIMATING OPERATIONS--The student will be able to:

02.01 Identify the equipment & materials used in estimating operations, their parts & functions, & the safety rules relating to their operation.
02.02 Define & explain the methods of reproduction illustrated by offset and letter press.
02.03 Define & explain the organization and management of a well organized printing company by identifying its organizational elements.
02.04 Define & explain an estimators duties including the categories of production pertaining to estimating.

02.05 Define & explain the role & responsibility of the estimator in a printing plant.
02.06 Define & explain the sources of information available to the estimator.
02.07 Define & explain the factors that must be considered by the estimator in preparing an estimate such as standard production times, budgeted hour cost rates, outside purchased services, and material costs.
02.08 Analyze terms used in estimating.
02.09 Place in sequential order the progressive steps for preparing an estimate.
02.10 Define & explain the principle characteristics of the different papers used in the printing process.
02.11 Define & explain the materials used in printing recalling costs of all items necessary to produce an accurate job estimate based on the cost of the job.
02.12 List the job tasks that usually appear on an estimating form.
02.13 List the job tasks that usually appear on an estimating form in the sequential order in which they are usually performed.
02.14 Apply formula for computing weight of paper stock.
02.15 Define & explain basic sheet sizes by listing the paper categories with the basic sheet size for each.
02.16 Prepare cost estimates utilizing given items, costs, & specifications for a 1-color, 1-up job.
02.17 Prepare cost estimates utilizing given items, costs, & specifications for a 1-color, multiple.
02.18 Prepare cost estimates utilizing given items, costs, & specifications for a 1-color, step job.
02.19 Prepare cost estimates utilizing given items, costs, & specifications for a 1-color, 4-page job.
02.20 Prepare cost estimates utilizing given items, costs, & specifications for a 1-color, 8-page job.
02.21 Prepare cost estimates utilizing given items, costs, & specifications for a over 4, 16-page folded, saddle stitched job.

03.0 PERFORM GRAPHIC DESIGN OPERATIONS--The student will be able to:

03.01 Identify the equipment & materials used in graphic design operations, their parts & functions, & the safety rules relating to their operation.
03.02 Set up & operate graphic design operation tools & equipment.
03.03 Perform operator maintenance on graphic design operation equipment.
03.04 Prepare thumbnail layout.
03.05 Prepare rough layout.
03.06 Prepare comprehensive layout including finish working dummy.
03.07 Size & proportion photographs, line drawings, & other copy elements.
03.08 Copyfit & mark up (specify type sizes & styles).

04.0 PERFORMING TYPOGRAPHICAL OPERATIONS--The student will be able to:

04.01 Identify the equipment & materials used in typographical operations, their parts & functions, & the safety rules relating to their operation.
04.02 Set up & operate typographical tools & equipment.
04.03 Perform operator maintenance on typographical equipment.
04.04 Define & explain typographic terms for measurement.
04.05 Set & proofread type by a variety of means.
04.06 Analyze & solve printing measurement problems using a group of specific facts, a system of logic & arithmetic based on printer's measurements.
04.07 Set up & operate a variety of typesetting machines.
04.08 Evaluate printed typed samples for visual spacing to mechanical spacing & certain letter combinations to other letter combinations and produce examples.
04.09 Define terms used in typesetting & typography & explain the difference.
04.10 Define & explain terms that deal with type identification.

04.11 Define & explain the elements of typography & their value in printing & design.
04.12 Solve copyfitting problems by applying typographic principles.
04.13 Evaluate typesetting systems by judging their advantages & their disadvantages.
04.14 Apply the principles of several copyfitting systems for counting manuscripts by predicting keystrokes in each system.
04.15 Perform manual, automatic, & semi-automatic justification decisions.

05.0 PERFORMING COPY PREPARATION OPERATIONS--The student will be able to:

05.01 Identify the equipment & materials used in copy preparation operations, their parts & functions, & the safety rules relating to their operation.
05.02 Set up & operate copy preparation tools & equipment.
05.03 Perform operator maintenance on copy preparation equipment.
05.04 Define & explain the scope & purpose of copy preparation.
05.05 Define & explain terms used in copy preparation.
05.06 Define & explain the career opportunities preparation.
05.07 Apply the principles of mechanical paste-up using printed type proofs.
05.08 Define, explain, & demonstrate how to scale by diagonal line method.
05.09 Define, explain & demonstrate the use of the proportion wheel.
05.10 Apply the use of the proportion wheel to various copy situations.
05.11 Define, explain, & demonstrate layout for mechanicals.
05.12 Define & explain the different types of light sensitive materials used on copy preparation.
05.13 Define, & explain, and apply the elements of mechanical masking.
05.14 Explain & demonstrate the use of a process color chart such as a Murphy color wheel when specifying color breaks.
05.15 Demonstrate the use of amberlith by cutting to the specific areas where color is to be masked in basic art drawings.
05.16 Demonstrate application of room light film materials.
05.17 Paste up mechanical elements including keyline for photographs & tint blocks; & ruling.
05.18 Prepare tissue overlay & specify color break, tint percentages, & reverses.
05.19 Check & compare completed mechanical to comprehensive layout for final proofing.

06.0 PERFORMING LINE GRAPHIC PHOTO OPERATIONS--The student will be able to:

06.01 Identify the equipment & materials used in line graphic photo operations, their parts & functions, & the safety rules relating to their operation.
06.02 Set up & operate line graphic photo tools & equipment.
06.03 Perform operator maintenance on line graphic photo equipment.
06.04 Analyze & solve lithographic scaling problems by analyzing facts, calculating proper sizes or percentages, & stating solutions in appropriate terms.
06.05 Define & explain the photographic record.
06.06 Define & explain terms relating to film construction.
06.07 Define & explain characteristics of film relating to speed, contrast, & color.
06.08 Define & explain terms relating to line photography.
06.09 Define & explain terms relating to electromagnetic energy & spectrum.
06.10 Demonstrate the application & alignment of camera planes & working parts.
06.11 Operate a process camera by making various adjustments & by making a series of negatives to produce appropriate results using a variety of photographic materials.
06.12 Demonstrate the application & limitation of the relationship between time, f/stop, exposure, & light intensity by using a reflection density guide & interpreting results.
06.13 Define & explain specific terms in relation to a process camera lens.
06.14 Define & explain lens abberations & flare.

06.15 Define & explain the law of inverse squares, law of reflection, and law of reflection of light.
06.16 Demonstrate application & limitation of the relationship between bellows extension, exposure, & f/stops by using formulas, charts, diaphram control systems & interpret results.
06.17 Demonstrate the mixing of photographic chemicals for processing of photographic materials by identifying rations, recognizing terms & different chemicals, & mixing them when necessary.
06.18 Operate a vacuum frame and use a variety of films, copy, & procedures.
06.19 Demonstrate application & procedures to produce film negatives & positives with a variety of films, equipment, & conditions.
06.20 Demonstrate the use of a reflection density guide by establishing a standard under a given set of conditions for prediction, control, & standardization of results.
06.21 Demonstrate the use of a density guide and the arithmetic behind it by identifying step relationships, explaining exposure changes to steps, by being able to explain changes in density, & by confirming them in laboratory practice.
06.22 Define & explain terms relating to photographic filters used in process photography.
06.23 Demonstrate the use of filters in laboratory projects.
06.24 Define & explain the need & value of establishing & maintaining standardized procedures.

07.0 PERFORMING GRAPHIC ARTS HALFTONE OPERATIONS--The student will be able to:

07.01 Identify the equipment & materials used in graphic arts halftone operations, their parts & functions, & the safety rules relating to their operation.
07.02 Set up & operate graphic arts halftone tools & equipment.
07.03 Perform operator maintenance on graphic arts halftone equipment.
07.04 Define halftone terminology.
07.05 Calibrate a reflection densitometer to manufacturer's specifications.
07.06 Compare & contrast the funding of the reflection densitometer with the Kodak Density Guide.
07.07 Solve a variety of exposure problems using an exposure computer.
07.08 Solve a variety of exposure problems using neutral density filters.
07.09 Demonstrate & explain a variety of special films such as litho pan, rapid access, and room light.
07.10 Evaluate a typical printed halftone under normal laboratory conditions and determine the best possible exposure combination to help establish laboratory standards halftone photography.
07.11 Develop sets of directions for the major basics of halftone photography, basic exposure, basic density range of the contact screen, basic density of the copy, basic flash, & basic material on which to print on.
07.12 Solve a variety of problems by applying the principles of densitometry and exposure.

08.0 PERFORMING COLOR REPRODUCTION OPERATIONS--The student will be able to:

08.01 Identify the equipment & materials used in color reproduction operations, their parts & functions, & the safety rules relating to their operation.
08.02 Set up & operate color reproduction tools & equipment.
08.03 Perform operator maintenance on color reproduction equipment.
08.04 Apply the principles of visible light by constructing a spectrograph & placing the major subdivisions of white light in their proper position according to scientific theory.
08.05 Define & explain the inter-relationship of light & color.
08.06 Define & explain the principles of color theory as they apply to process printing.
08.07 Define & explain the difference between additive & subtractive color.
08.08 Define & explain the color absorption/reflection theory as it applies to process color filters & printing inks.

08.09 Compare & contrast color separation systems for direct, indirect, & electronic scanning.
08.10 Interpret manufacturer's film data sheets of various applicable films.
08.11 Define & explain densitometry & sensitometry.
08.12 Apply the principles of densitometry & sensitometry to establish local laboratory standards.
08.13 Define & explain the requirements for photographic color separation by listing the materials, equipment, facilities, and special considerations required in the process.
08.14 Define & explain the requirements for color production by graphing & interpreting the deficiencies of printing inks in the problem is to be solved.

09.0 PERFORMING STRIPPING OPERATIONS--The student will be able to:

09.01 Identify the equipment & materials used in stripping operations, their parts & functions, & the safety rules relating to their operation.
09.02 Set up & operate stripping operations tools & equipment.
09.03 Perform operator maintenance on stripping operations equipment.
09.04 Define & explain terms used in stripping.
09.05 Define & explain stripping as a career opportunity.
09.06 Analyze the various approaches to stripping by comparing & contrasting preprinted masking sheets with conventional nonprinted masking sheets.
09.07 Identify the parts of a contact frame & point light source & explain their use.
09.08 Produce contacts using orthochromatic & duplicating film using transmission density guide & standard time & temperature development.
09.09 Identify equipment & materials used in the stripping function & the safety rules pertaining to each.
09.10 Apply basic principles of stripping using: T-square & triangle to align, position, & tape film (emulsion side up) on ruled or unruled plastic or paper making sheets; open windows; & opaque on the emulsion side.
09.11 Prepare working dummy & produce a 1-color, 1-up layout.
09.12 Prepare working dummy & produce a 1-color, multiple layout.
09.13 Define & explain methodology relating to step-and-repeat by choosing or recognizing the different procedures relating to particular situations.
09.14 Prepare working dummy & produce a 1-color, step layout.
09.15 Prepare working dummy & produce a 1-color, 4-page layout.
09.16 Prepare working dummy & produce a 1-color, 8-page layout.
09.17 Demonstrate the cutting of rubylith masks by trapping to key line negatives.
09.18 Prepare a working dummy & apply principles of a pin-register system to produce a multiple-burn exposure layout (halftone & screen tints).
09.19 Prepare a working dummy & apply principles of a pin-register system to produce & strip a multi-flat color layout.
09.20 Produce composed film from multi-flat color layout & strip in position.
09.21 Inspect & evaluate flats to original mechanical.

10.0 PERFORM PROOFING & PLATEMAKING OPERATIONS--The student will be able to:

10.01 Identify the equipment & materials used in proofing & platemaking operations, their parts & functions, & the safety rules relating to their operation.
10.02 Set up & operate proofing & platemaking tools & equipment.
10.03 Perform operator maintenance on proofing & platemaking equipment.
10.04 Identify equipment & materials used in proofing & platemaking to obtain proper exposures using a transmission density guide.
10.05 Produce proofs on diazo, silver, & color proofing materials.
10.06 Inspect & evaluate proofs to original mechanical.
10.07 Identify, contrast, & compare image carriers such as paper, photo direct, foil, aluminum additive, & aluminum subtractive for run length & quality to suit customer specifications.

10.08 Process paper, photo direct, foil, aluminum additive, & aluminum subtractive image carriers to manufacturer specifications.
10.09 Inspect & evaluate plates to proofs.
10.10 File, handle, & retrieve flats & plates.

11.0 PERFORM OFFSET OPERATIONS--The student will be able to:

11.01 Identify the equipment & materials used in offset presswork operations, their parts & functions, & the safety rules rules relating to their operation.
11.02 Set up & operate offset presswork tools & equipment.
11.03 Perform operator maintenance on offset presswork equipment.
11.04 Define & explain the basic principle of the lithographic process.
11.05 Compare & contrast a single-sheet feeder, stream-fed, web-fed systems.
11.06 Compare & contrast deliver systems for sheet- & web-fed systems.
11.07 Compare & contrast register systems such a side-guide, pull-guide, & head register.
11.08 Compare & contrast ink & moisture system for sheet- and web-fed systems.
11.09 Explain make ready procedures in proper sequence in preparation for actual production.
11.10 Apply basic principles of offset lithography pertaining to dampening systems (ducted & continuous).
11.11 Apply basic principles of offset lithography pertaining to fountain solutions chemical components (acid, alkaline, & neutral).
11.12 Apply basic principles of offset lithography pertaining to pH control & its effects on the lithographic process.
11.13 Apply basic principles of offset lithography pertaining to interrelationships of paper.
11.14 Demonstrate the inking system by identifying each part & making proper adjustments.
11.15 Make ready & demonstrate feeder & delivery systems.
11.16 Demonstrate methods for achieving register by making machine adjustments.
11.17 Apply basic principles of offset press operations to produce work & turn, work & tumble, & sheetwise printed products.

12.0 PERFORM FINISHING OPERATIONS--The student will be able to:

12.01 Identify the equipment & materials used finishing/binding operation, their parts & functions, & the safety rules relating to their operation.
12.02 Identify basic principles of finishing/binding operations pertaining to prepress paper cutting, post press paper cutting & post bindery cutting (after folding, stitching, etc.).
12.03 Apply basic principles of finishing/binding operations pertaining to sheet cutting.
12.04 Identify basic principles of finishing/binding operations pertaining to grain, caliper, & finish (coated or uncoated) of paper.
12.05 Identify basic principles of finishing/binding operations pertaining to signature configurations for sheet & web presses.
12.06 Apply basic principles of finishing/binding operations pertaining to folding.
12.07 Apply basic principles of finishing/binding operations pertaining to scoring & perforating.
12.08 Identify basic principles of finishing/binding operations pertaining to collating & gathering.
12.09 Identify basic principles of finishing/binding operations pertaining to binding alternatives (saddle, side, perfect, comb, spiral, case, etc.).
12.10 Identify basic principles of finishing/binding operations pertaining to adhesive binding (padding & fan-apart).

13.0 PERFORM EMPLOYABILITY SKILLS--The student will be able to:

13.01 Conduct a job search.
13.02 Secure information about a job.

13.03 Identify documents that may be required when applying for a job.
13.04 Complete a job application form correctly.
13.05 Demonstrate competence in job interview techniques.
13.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
13.07 Identify acceptable work habits.
13.08 Demonstrate knowledge of how to make job changes.
13.09 Demonstrate acceptable employee health habits.
13.10 Interview job applicants.
13.11 Develop & monitor safe & efficient work practices.
13.12 Stimulate, motivate, and direct the development of others.
13.13 Interact effectively with customers & vendors.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship.
14.02 Describe the importance of entrepreneurship to the American economy.
14.03 List the advantages and disadvantages of business ownership.
14.04 Identify the risks involved in ownership of a business.
14.05 Identify the necessary personal characteristics of a successful entrepreneur.
14.06 Identify the business skills needed to operate a small business efficiently and efectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Graphic Design Technology

CODE NUMBER: Secondary ______ Postsecondary GRA0990

Florida CIP IN50.040200

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ______7-9 ______9-12 ______Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-15

CERTIFICATION COVERAGE: PRINTING 7 COMM ART 7 TEC CONSTR @ 7
BLDG CONST @ 7 TEC PROD @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as graphic designers (141.061-018), illustrators (970.661-010) and (141.061-022), creative directors (141.067-010), delineators (970.281-014), photostat operators (976.382-022), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, illustration, style/technique/medium, concept formulation, design, drawing, lettering, display/exhibit design, layout, paste-up and mechanical preparation, printing processes, air-brush techniques, use of industry tools and equipment, use and care of materials, use of current industry standards/practices/techniques, typography, photographic procedures, color theorm, marketing/advertising theorm, outdoor advertising, T. V. graphics, computer-aided layout, and portfolio development.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in illustration, concept formulation, design, drawing, lettering, display/exhibit design, layout, paste-up and mechanical preparation, air-brush techniques, use of tools and equipment, use of materials, use of techniques/practices/standards, typography, photographic procedures, color application, outdoor advertising design, T. V. graphics, computer aided layout, and portfolio development.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The typical length of this program for the average achieving student is 1600 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate effective communication skills.
02. Demonstrate leadership skills.
03. Demonstrate safe and efficient work practices.
04. Perform illustrations.
05. Demonstrate style/techniques.
06. Demonstrate mediums.

07. Formulate concepts/theory.
08. Apply design theories.
09. Demonstrate drawing techniques.
10. Letter effectively.
11. Create exhibit/display designs.
12. Create advertising layouts.
13. Perform paste-ups.
14. Printing processes.
15. Interpret printing process.
16. Create airbrush illustrations.
17. Demonstrate proper use of industry tools and equipment.
18. Demonstrate proper use and care of industry materials.
19. Demonstrate knowledge of current industry standards, practices, techniques.
20. Demonstrate creative use of typography.
21. Create outdoor advertising design.
22. Interpret photographic procedures.
23. Apply marketing/advertising theories.
24. Apply color theories.
25. Develop industry-level portfolios.
26. Design television graphics.
27. Create computer-aided layouts.
28. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS

GRAPHIC DESIGN TECHNOLOGY

01.0 DEMONSTRATE EFFECTIVE COMMUNICATION SKILLS — The student will be able to:

01.01 Demonstrate presentation skills.
01.02 Prepare written correspondence.
01.03 Demonstrate good telephone technique.
01.04 Read and interpret written and oral instructions.

02.0 DEMONSTRATE LEADERSHIP SKILLS — The student will be able to:

02.01 Demonstrate management abilities.
02.02 Demonstrate leadership qualities.

03.0 DEMONSTRATE SAFE AND EFFICIENT WORK PRACTICES — The student will be able to:

03.01 Follow industry rules, safety regulations and policies.
03.02 Demonstrate proper use of toxic materials.

04.0 PERFORM ILLUSTRATION — The student will be able to:

04.01 Create line art.
04.02 Demonstrate hard and soft line illustrations.
04.03 Demonstrate transparent and opaque techniques.
04.04 Create cartoons, caricatures, and animations.
04.05 Create fashion illustration.
04.06 Develop illustration skills and techniques.
04.07 Apply screen tints and color films for illustrations.

05.0 DEMONSTRATE STYLE/TECHNIQUES — The student will be able to:

05.01 Select appropriate style or tecnique to problem solving.
05.02 Display creative talent and ingenuity.

06.0 DEMONSTRATE MEDIUMS — The student will be able to:

06.01 Apply use of a variety of artistic media.

07.0 FORMULATE CONCEPT/THEORY — The student will be able to:

07.01 Apply principles of design.
07.02 Demonstrate the design process.

08.0 APPLY DESIGN THEORIES — The student will be able to:

08.01 Create a design in back and white or color.
08.02 Create various mockups and dummies.
08.03 Produce quality comprehensive layouts in a variety of formats.

09.0 DEMONSTRATE DRAWING TECHNIQUES — The student will be able to:

09.01 Draw three dimensional shapes.
09.02 Draw still life.
09.03 Draw figures.
09.04 Demonstrate use of perspective.

10.0 LETTER EFFECTIVELY — The student will be able to:

10.01 Choose appropriate letterstyles.
10.02 Utilize pen, brush, marker, and pencil lettering.
10.03 Demonstrate correct spacing of letters.
10.04 Demonstrate creative calligraphic lettering.

11.0 CREATE EXHIBIT/DISPLAY DESIGNS — The student will be able to:

11.01 Apply 2D or 3D design principles.
11.02 Construct scale models.
11.03 Indicate proper specifications for design.
11.04 Coordinate production of displays and exhibits.

12.0 CREATE ADVERTISING LAYOUTS — The student will be able to:

12.01 Produce comprehensive layouts for advertising in newspaper, advertising, magazines, billboards, and a advertising campaign.
12.02 Identify advertising needs and develop appropriate solution.

13.0 PERFORM PASTE-UPS — The student will be able to:

13.01 Demonstrate paste-up techniques.
13.02 Perform cropping of photograph and sizing of illustrations.
13.03 Prepare mechanicals "one-color, two-color, three-color, four-color" separations.
13.04 Prepare amberlith overlays.
13.05 Demonstrate techniques for knockouts and dropouts.
13.06 Demonstrate proper registration of color and overlays.
13.07 Demonstrate proper clean-up, opaquing procedures.

14.0 PRINTING PROCESSES — The student will be able to:

14.01 Analyze and identify method of proofing.
14.02 Determine methods of printing.
14.03 Select stocks and inks.
14.04 Explain color separation process.
14.05 Identify and specify half-tone and line negatives.
14.06 Interpret stripping procedures.
14.07 Identify speciality printing methods.

15.0 INTERPRET PRINTING PROCESS — The student will be able to:

15.01 Identify special printing methods.
15.02 Explain basic print process.
15.03 Interpret signature and imposition procedures.

16.0 CREATE AIR BRUSH ILLUSTRATIONS — The student will be able to:

16.01 Operate and maintain air brush and air supply.
16.02 Determine proper air brush technique.
16.03 Select proper surface and paint.
16.04 Apply masking materials.
16.05 Perform photo-retouching (color) (b+w).

17.0 DEMONSTRATE PROPER USE OF INDUSTRY TOOLS AND EQUIPMENT — The student will be able to:

17.01 Operate and maintain drafting equipment.
17.01 Utilize and read various scales.

18.0 DEMONSTRATE PROPER USE AND CARE OF INDUSTRY MATERIALS — The student will be able to:

18.01 Operate and maintain camera and processer (Photostats).
18.02 Operate and maintain galley/art waxer.

19.0 DEMONSTRATE KNOWLEDGE OF CURRENT INDUSTRY STANDARDS, PRACTICES TECHNIGUES — The student will be able to:

19.01 Explain copyright procedures.
19.02 Utilize industry terminology.
19.03 Identify industry practice and procedures.
19.04 Explain importance of meeting deadlines.
19.05 Acquire up-to-date in-field technology.
19.06 Learn how to cope with stress.
19.07 Adjust to work conditions.
19.08 Adapt properly to interdepartmental communications.
19.09 Identify clip-art images.

20.0 DEMONSTRATE CREATIVE USE OF TYPOGRAPHY — The student will be able to:

20.01 Apply dry transfer lettering.
20.02 Develop knowledge of type styles.
20.03 Demonstrate knowledge of typographical specifications.
20.04 Develop knowledge of type construction design.

20.05 Allow proper letters and line spaces for typesetting.
20.06 Develop working knowledge of typespacing.

21.0 CREATE OUT ADVERTISING DESIGN — The student will be able to:

21.01 Develop bill boards and posters design.
21.02 Prepare scale art.
21.03 Apply specific design principles to outdoor situations.

22.0 INTERPRET PHOTOGRAPHIC PROCEDURES — The student will be able to:

22.01 Coordinate photographic procedures with photographer.
22.02 Preform cropping and scaling.
22.03 Prepare art cards for multi-media.
22.04 Apply specification terminology.
22.05 Operate camera.
22.06 Indentify graphic arts photo principles and practices.
22.07 Create an artistic photographic image.
22.08 Utilize the photographic procedures.
22.09 Produce a half-tone screen image.

23.0 APPLY MARKETING/ADVERTISING THEORIES — The student will be able to:

23.01 Apply marketing/advertising theories.
23.02 Identify customer needs.
23.03 Identify target market.
23.04 Prepare cost estimate.
23.05 Analye marketing potential.
23.06 Recognize proper use of specialty services (supplies, specialties).
23.07 Identify marketing procedures.
23.08 Identify advertising procedures.
23.09 Interpret advertisting agency skills and procedures.

24.0 APPLY COLOR THEORIES — The student will be able to:

24.01 Use color for impact.
24.02 Apply color symbolically (pschology).
24.03 Develop knowledge of color theory.
24.04 Apply color theory and appropriate principles for use in design.

25.0 DEVELOP INDUSTRY-LEVEL PROTFOLIOS — The student will be able to:

25.01 Demonstrate mounting and matting procedure.
25.02 Demonstrate industry presentation procedure and techniques.
25.03 Prepare industry level portfolio.

26.0 DESIGN TELEVISION GRAPHICS — The student will be able to:

26.01 Produce T.V. story boards.
26.02 Create T.V. art cards.

27.0 CREATE COMPUTER-AIDED LAYOUTS — The student will be able to:

27.01 Perform pagination.
27.02 Create color graphics.
27.03 Create computer illustration.

28.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS — The student will be able to:

28.01 List sources of job openings other than public or private employment agencies.
28.02 Write a letter of application for a job.
28.03 Prepare a vita, resume or personal fact sheet.
28.04 List factors to consider when applying for a job.
28.05 List ways of making contact with employers.
28.06 Identify documents which may be required when applying for a job interview.
28.07 Complete a job application form correctly.
28.08 Identify appropriate dress and grooming for a job interview.
28.09 Classify behaviors considered appropriate or inappropriate in a job interview situation.
28.10 Describe advantages to employer and employees of being a productive worker.
28.11 Explain the purpose of supervision, self discipline and performance evaluation.
28.12 Identify appropriate response (s) to criticism from employer, supervisor or other employees.

28.13 List consequences of being absent frequently from the job.
28.14 List consequences of frequently arriving late for work.
28.15 List factors to consider when resigning from a job.
28.16 Write a letter of resignation.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Heavy Duty Truck and Bus Mechanics

CODE NUMBER: Secondary ________ Postsecondary DIM0991

Florida CIP IN47.060501

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS __________

APPLICABLE LEVELS(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 13-17

CERTIFICATION COVERAGE: HEAVY DUTY TRUCK AND BUS MECHANICS 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as diesel mechanics (625.281-010), diesel mechanic helpers (625.684-010), preventive maintenance mechanics (620.281-050), electrical system specialists (825.281-022), fuel injection specialists (625.281-022), and truck and bus mechanics (625.281-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the development of diesel trade skills to repair engines, operating systems, and chassis of heavy trucks and buses.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in tools, diagnostic equipment, and test equipment. The materials and processes used in the laboratory are similar to those used in industry. Graduates will be able to use the various tools and precision equipment found in general use throughout the heavy truck and bus mechanics industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

In various cases, students must be trained to troubleshoot and repair in specialtity areas such as Caterpillar diesel mechanics, Cummins diesel mechanics, Detroit diesel mechanics, IHC diesel mechanics, or Mack diesel mechanics.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for the postsecondary adult vocational program is: Mathematics 8.0, Language 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 contact hours (2160 clock hours).

IV. INTENDED OUTCOMES: After sucessfully completing this program, the individual will be able to:

01. Demonstrate proficiency in performing diesel trade skills.
02. Demonstrate proficiency in applying electrical principles.
03. Demonstrate proficiency in applying electronic principles.
04. Demonstrate proficiency in maintaining and repairing gasoline and diesel engines.
05. Demonstrate proficiency in maintaining and repairing electrical systems.
06. Demonstrate proficiency in reconditioning diesel fuel injection systems.
07. Demonstrate proficiency in reconditioning gasoline engine components.
08. Demonstrate proficiency in reconditioning diesel engine components.
09. Demonstrate proficiency in maintaining and repairing power train systems and components.
10. Demonstrate proficiency in maintaining and repairing brake systems.
11. Demonstrate proficiency in maintaining and repairing chassis components.
12. Demonstrate proficiency in maintaining and repairing hydraulic systems.
13. Demonstrate proficiency in maintaining and repairing air conditioning and heating systems.
14. Demonstrate employability skills
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education
SECONDARY NUMBER:
PROGRAM TITLE: Heavy Duty Truck and Bus Mechanics
POSTSECONDARY NUMBER: DIM0991

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING DIESEL TRADE SKILLS--The student will be able to:

01.01 Follow safety practices
01.02 Apply basic math skills
01.03 Apply intermediate math skills
01.04 Recognize, identify, and make metric conversions
01.05 Perform basic welding skills
01.06 Use hand tools
01.07 Use power tools
01.08 Use measuring and precision tools
01.09 Identify types of bearings and seals
01.10 Identify power train components and functions
01.11 Identify threaded fasteners by size, type, thread series, thread classes, material hardness, and compatibility
01.12 Read and use parts manuals
01.13 Read, interpret, and apply service manuals

02.0 DEMONSTRATE PROFICIENCY IN APPLYING ELECTRICAL PRINCIPLES --The student will be able to:

02.01 Identify the nature of electricity
02.02 Analyze electrical circuits
02.03 Define Ohm's and Kirchhoff's laws
02.04 Identify magnetism and electromagnetic induction
02.05 Identify applications of alternating current
02.06 Identify principles of DC motors and generators
02.07 Identify principles of AC motors
02.08 Locate and match electrical units by their symbols on a wiring diagram
02.09 Set up and use voltmeters, ammeters, and ohmmeters

03.0 DEMONSTRATE PROFICIENCY IN APPLYING ELECTRONIC PRINCIPLES --The student will be able to:

03.01 Identify principles of diodes and rectifiers
03.02 Identify principles of voltage regulation and power supply circuits
03.03 Identify principles of transistors
03.04 Identify principles of the silicon controlled rectifier (SCR)
03.05 Identify components of electronic systems and their functions

04.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING GASOLINE AND DIESEL ENGINES--The student will be able to:

04.01 Identify gasoline and diesel engine operating principles (2- and 4-stroke cycle engines)
04.02 Identify components of 2- and 4-stroke cycle engines
04.03 Troubleshoot and repair cooling systems
04.04 Troubleshoot and repair lubrication systems
04.05 Troubleshoot and repair induction and exhaust systems

05.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING ELECTRICAL SYSTEMS --The student will be able to:

05.01 Test and service batteries
05.02 Test and repair starting systems
05.03 Test and repair DC charging systems
05.04 Test and repair AC charging systems
05.05 Test and repair ignition systems
05.06 Test and repair lighting and accessories systems
05.07 Test and service instruments and gauges

06.0 DEMONSTRATE PROFICIENCY IN RECONDITIONING DIESEL FUEL INJECTION SYSTEMS --The student will be able to:

06.01 Identify fuel injection systems principles and components
06.02 Troubleshoot fuel injection systems and components

06.03 Remove, replace, and adjust fuel injection systems and components
06.04 Identify governor types and operating principles
06.05 Troubleshoot governors
06.06 Remove, repair or replace, and adjust governors

07.0 DEMONSTRATE PROFICIENCY IN RECONDITIONING GASOLINE ENGINE COMPONENTS --The student will be able to:

07.01 Explain the basic principles of the operation of the 4-stroke cycle gasoline engine
07.02 Identify engine assemblies and systems
07.03 Diagnose valve and head problems by use of the visual inspection method
07.04 Diagnose valve and head problems by use of the compression tester method or cylinder air pressure method
07.05 Diagnose valve and head problems by use of the stethoscope method
07.06 Disassemble engines
07.07 Clean and inspect heads for cracks, warpage, and valve guides
07.08 Inspect valves for warpage, burns, cracks, stem wear, tip wear, and valve seat
07.09 Grind valve seats and reface valves
07.10 Check and inspect springs for free height, distortion, and installed height
07.11 Adjust valve lash
07.12 Remove and inspect camshaft bearings and lifters
07.13 Time valve drive assemblies
07.14 Remove pistons from rod assemblies
07.15 Measure out-of-round and cylinder taper with a dial bore gauge
07.16 Check piston pins and boss for wear
07.17 Measure piston ring lands width, out-of-round, and taper
07.18 Measure the piston ring gap in a cylinder bore
07.19 Install and fit piston pins
07.20 Check rod and piston assembly alignment
07.21 Remove and replace rod bearings
07.22 Hone and clean cylinders
07.23 Install rings on pistons
07.24 Measure and check crankshafts with a micrometer
07.25 Check the bearing bore with a telescoping gauge
07.26 Reassemble engines using a plastic gauge
07.27 Install oil seals
07.28 Check for end play

08.0 DEMONSTRATE PROFICIENCY IN RECONDITIONING DIESEL ENGINE COMPONENTS --The student will be able to:

08.01 Explain the basic principles of the operation of the 4-stroke cycle diesel engine
08.02 Identify engine assemblies and systems
08.03 Diagnose valve and head problems by use of the visual inspection method
08.04 Diagnose valve and head problems by use of the compression tester method or cylinder air pressure method
08.05 Diagnose valve and head problems by use of the stethoscope method
08.06 Disassemble engines
08.07 Clean and inspect heads for cracks, warpage, and injector sleeves
08.08 Inspect valves for warpage, burns, cracks, stem wear, tip wear, and valve seat
08.09 Grind valve seats and reface valves
08.10 Check and inspect springs for free height, distortion, and installed height
08.11 Adjust valve lash
08.12 Remove and inspect camshaft bearings and lifters
08.13 Time valve drive assemblies
08.14 Remove pistons from rod assemblies
08.15 Measure out-of-round and cylinder taper with a dial bore gauge or micrometer
08.16 Check piston pins and boss for wear
08.17 Measure piston ring lands width, out-of-round, and taper
08.18 Measure the piston ring gap in a cylinder bore
08.19 Install and fit piston pins
08.20 Check rod and piston assembly alignment
08.21 Remove and replace rod bearings
08.22 Hone and clean cylinders

08.23 Install rings on pistons
08.24 Measure and check crankshafts with a micrometer
08.25 Check the bearing bore with a telescoping gauge
08.26 Reassemble engines using a plastic gauge
08.27 Install oil seals
08.28 Check for end play

09.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING POWER TRAIN SYSTEMS AND COMPONENTS--The student will be able to:

09.01 Identify power train operating principles and components
09.02 Troubleshoot power trains
09.03 Recondition clutches
09.04 Recondition standard transmissions
09.05 Recondition automatic transmissions
09.06 Recondition differentials and final drives
09.07 Recondition drive lines
09.08 Recondition power take-offs
09.09 Recondition transfer cases

10.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING BRAKE SYSTEMS --The student will be able to:

10.01 Identify air brake principles and components
10.02 Identify hydraulic brake principles and components
10.03 Identify parking brake principles and components
10.04 Troubleshoot brake systems
10.05 Service and recondition hydraulic brake systems
10.06 Service and recondition air brake systems
10.07 Service and recondition engine brakes
10.08 Service and recondition parking brakes

11.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING CHASSIS COMPONENTS --The student will be able to:

11.01 Recondition conventional steering systems
11.02 Recondition hydraulic steering systems
11.03 Recondition rear axle suspensions
11.04 Recondition front axle suspensions
11.05 Service wheels, bearings, hubs, and seals
11.06 Service tires
11.07 Recondition fifth wheels

12.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING HYDRAULIC SYSTEMS --The student will be able to:

12.01 Identify basic principles of hydraulics
12.02 Identify operating components of hydraulic systems
12.03 Locate and match hydraulic units by their symbols on a diagram
12.04 Troubleshoot hydraulic circuits using test equipment
12.05 Maintain hydraulic fluid, filters, lines, and reservoirs
12.06 Recondition hydraulic pumps and motors
12.07 Recondition control valves
12.08 Recondition hydraulic cylinders
12.09 Recondition hydraulic accessories

13.0 DEMONSTRATE PROFICIENCY IN MAINTAINING AND REPAIRING AIR CONDITIONING AND HEATING SYSTEMS--The student will be able to:

13.01 Inspect and pressure test a basic A/C system
13.02 Inspect, remove, and replace compressor belts
13.03 Discharge, evacuate, and charge a basic A/C system
13.04 Leak test a basic A/C system
13.05 Service A/C electrical circuits
13.06 Service vacuum circuits
13.07 Diagnose basic A/C system problems
13.08 Remove and replace components in basic A/C systems
13.09 Remove and replace engine fan clutches
13.10 Service air conditioning systems
13.11 Service heating systems
13.12 Remove and replace blower motors
13.13 Diagnose heater malfunctions
13.14 Remove and replace heater cores, control units, and cables

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search
14.02 Secure information about a job
14.03 Identify documents that may be required when applying for a job
14.04 Complete a job application form correctly
14.05 Demonstrate competence in job interview techniques
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
14.07 Identify acceptable work habits
14.08 Demonstrate knowledge of how to make job changes appropriately
14.09 Demonstrate acceptable employee health habits

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship
15.02 Describe the importance of entrepreneurship to the American economy
15.03 List the advantages and disadvantages of business ownership
15.04 Identify the risks involved in ownership of a business
15.05 Identify the necessary personal characteristics of a successful entrepreneur
15.06 Identify the business skills needed to operate a small business efficiently and effectively

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Heavy Equipment Mechanics

CODE NUMBER: Secondary ______ Postsecondary DIM0990

Florida CIP IN47.030200

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ______7-9 ______9-12 ______Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-17

CERTIFICATION COVERAGE: DESEL MECH 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as construction equipment mechanics (620.261-022), industrial truck mechanics (620.281-050), maintenance mechanics (620.281-046), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, troubleshooting, preventative maintenance, and repair of heavy equipment, including engines and components, and test operation of equipment.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in maintenance, repair and rebuilding components of heavy equipment including engines, electrical systems, fuel systems, tracks, brake systems, hydraulic systems, power transfer and drive systems, and chassis. Test operation of repaired equipment is included.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of safety, communication and leadership skills required in the trade.
02. Demonstrate the use and care of hand tools, power tools, and equipment.
03. Identify engine components.
04. Maintain, troubleshoot, and overhaul heavy equipment engines.
05. Maintain, troubleshoot, and repair electrical systems.
06. Maintain, troubleshoot, and repair fuel systems.
07. Maintain and repair track systems.
08. Maintain and repair mechanical, hydraulic, and air brake systems.

09. Maintain, troubleshoot, and repair hydraulic systems.
10. Maintain, troubleshoot, and repair winches, clutches and transmissions.
11. Maintain, troubleshoot and repair differentials, final drives, and drivelines.
12. Inspect and repair chassis.
13. Test drive equipment.
14. Demonstrate ability to perform preventative maintenance and complete oil analysis program.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ____________

PROGRAM TITLE: Heavy Equipment Mechanics POSTSECONDARY NUMBER: DIM0990

01.0 DEMONSTRATE KNOWLEDGE OF SAFETY, COMMUNICATION AND LEADERSHIP SKILLS REQUIRED IN THE TRADE--The student will be able to:

01.01 Comply with all safety rules and regulations.
01.02 Use all tools properly.
01.03 Read, interpret and apply service, manual knowledge to the satisfaction of the instructor.
01.04 Perform all assigned tasks utilizing integrity and doing your best work.

02.0 DEMONSTRATE THE USE AND CARE OF HAND TOOLS, POWER TOOLS, AND EQUIPMENT--The student will be able to:

02.01 Perform assigned tasks utilizing hand tools, power tools and equipment to the satisfaction of the instructor.
02.02 List basic rules concerning proper care of tools and equipment.
02.03 Identify safety methods utilized and steps to follow under an emergency type condition.

03.0 IDENTIFY ENGINE COMPONENTS--The student will be able to:

03.01 Identify each engine component from pictured materials by matching that component to its proper title and purpose.
03.02 Identify engine components displayed within the shop area to the satisfaction of the assigned instructor.

04.0 MAINTAIN, TROUBLESHOOT, AND OVERHAUL HEAVY EQUIPMENT ENGINES--The student will be able to:

04.01 Remove and replace cylinder head(s).
04.02 Remove and replace valves, springs, retainers and keepers.
04.03 Clean cylinder head and check it for cracks.
04.04 Reface valves.
04.05 Grind valve seats.
04.06 Check valve guides.
04.07 Remove, check and replace oil pan.
04.08 Remove piston and rod assemblies.
04.09 Clean piston and ring grooves.
04.10 Install piston rings.
04.11 Install piston and rod assemblies in block.
04.12 Check cylinder head for warpage.
04.13 Check cylinder block for warpage and cracks.
04.14 Tap-out threaded holes.
04.15 Remove and replace timing gear cover.
04.16 Remove and replace flywheel and flywheel housing.
04.17 Install front and rear crankshaft seal.
04.18 Remove crankshaft.
04.19 Measure crankshaft (main and rod journals).
04.20 Install main bearings.
04.21 Install rod bearings.
04.22 Check installed main and rod bearing clearance.
04.23 Torque main bearing and rod bearing caps.
04.24 Torque cylinder head(s).
04.25 Adjust valves.
04.26 Adjust injectors and injection control rack.
04.27 Remove and install water pump.
04.28 Remove and install oil pump.
04.29 Dissemble and re-assemble oil pump.
04.30 Remove and install injection pump.
04.31 Remove and install turbocharger.
04.32 Remove and install blower.
04.33 Disassemble and reassemble blower.
04.34 Measure blower clearances.
04.35 Remove and install vibration damper.
04.36 Adjust governor.
04.37 Set idle speeds (low and high).
04.38 Remove and install air and oil filter.

05.0 MAINTAIN, TROUBLESHOOT, AND REPAIR ELECTRICAL SYSTEMS--The student will be able to:

05.01 Remove, clean and install battery.
05.02 Install batteries correctly where two or more batteries are utilized.
05.03 Install battery cables correctly for a series hook-up.
05.04 Visually inspect a battery.
05.05 Test battery with hydrometer, voltmeter and load tester.
05.06 Make connections and charge a battery.
05.07 Remove a starter and install starter.
05.08 Troubleshoot an electrical starting system.
05.09 Replace a starter drive.
05.10 Replace starter motor brushes and solenoid.
05.11 Troubleshoot starter motor on vehicle.
05.12 Troubleshoot starter motor on bench.
05.13 Test armature for shorts, grounds and opens.
05.14 Test field coils for opens and grounds.
05.15 Remove and replace alternator.
05.16 Troubleshoot an electrical charging system with alternator.
05.17 Test alternator rotor for grounds, shorts and opens.
05.18 Test alternator starter windings for grounds and opens.
05.19 Test and replace regulator.

06.0 MAINTAIN,TROUBLESHOOT, AND REPAIR FUEL SYSTEMS--The student will be able to:

06.01 Adjust engine high speed.
06.02 Adjust engine idle.
06.03 Bleed fuel system.
06.04 Calibrate governor.
06.05 Clean injector.
06.06 Install and time fuel injection pump.
06.07 Replace fuel filters.
06.08 Replace fuel injector.
06.09 Troubleshoot fuel injection pump.
06.10 Troubleshoot fuel injector.

07.0 MAINTAIN AND REPAIR TRACK SYSTEMS--The student will be able to:

07.01 Remove and replace track assembly, master pin type.
07.02 Remove and replace track assembly, split master link type.
07.03 Replace bolt on sprocket segments.
07.04 Measure track assembly for wear, link height, internal pin and bushing and external bushing.
07.05 Measure sprocket for wear.
07.06 Measure bottom rollers for wear.
07.07 Measure top rollers for wear.
07.08 Measure idler for wear.
07.09 Align roller frame to sprocket.
07.10 Align top roller and idler to sprocket.
07.11 Remove and replace roller frame.
07.12 Remove and replace top rollers.
07.13 Remove and replace bottom rollers.
07.14 Repair bottom rollers.
07.15 Repair top rollers.

08.0 MAINTAIN AND REPAIR MECHANICAL, HYDRAULIC, AND AIR BRAKE SYSTEMS--The student will be able to:

08.01 Remove and replace brake master cylinder.
08.02 Bleed air from brake master cylinder.
08.03 Rebuild single piston master cylinder.
08.04 Remove, repair and replace necessary items in a drum type brake assembly.
08.05 Adjust drum type brakes.
08.06 Rebuild brake cylinder.
08.07 Measure for wear on brake drum.
08.08 Remove and replace caliper on disk type brake.
08.09 Rebuild caliper assembly.
08.10 Replace brake pads.
08.11 Bleed air from brakes.
08.12 Measure disk for wear.
08.13 Remove, repair and reassemble cam type air drum brake.

08.14 Remove, repair and reassemble wedge type air drum brake.
08.15 Adjust slack adjuster on cam type air drum brake.
08.16 Rebuild air chamber (single and double chamber).
08.17 Remove, repack, replace and adjust wheel bearings.
08.18 Troubleshoot vacuum booster.
08.19 Troubleshoot hydrovac booster.
08.20 Service air brake system.
08.21 Repair air compressor.
08.22 Adjust air compressor governor.

09.0 MAINTAIN, TROUBLESHOOT, AND REPAIR HYDRAULIC SYSTEMS--The student will be able to:

09.01 Drain and refill hydraulic reservoir making all checks for contaminated fluid.
09.02 Remove and replace all hydraulic system screens and filters.
09.03 Remove and replace hydraulic hoses and metal lines.
09.04 Remove and replace hydraulic system oil pump.
09.05 Rebuild gear and vane type pump.
09.06 Troubleshoot hydraulic pump.
09.07 Check oil pressure.
09.08 Adjust relief valve.
09.09 Remove and replace hydraulic control valves.
09.10 Repair hydraulic control valves.
09.11 Troubleshoot hydraulic control valve.
09.12 Remove and replace hydraulic cylinder.
09.13 Rebuild hydraulic cylinder.
09.14 Troubleshoot hydraulic cylinder.

10.0 MAINTAIN, TROUBLESHOOT, AND REPAIR WINCHES, CLUTCHES AND TRANSMISSIONS--The student will be able to:

10.01 Demonstrate knowledge and ability to troubleshoot, maintain and repair winches.
10.02 Remove and replace steering clutch and steering brake.
10.03 Rebuild steering clutch.
10.04 Adjust push type master clutch.
10.05 Adjust pull type master clutch.
10.06 Inspect flywheel surface for wear or cracks.
10.07 Remove and replace push type master clutch, single or double disk.
10.08 Remove and replace pull type master clutch, single or double disk.
10.09 Replace pilot bearing.
10.10 Replace clutch stop brake.
10.11 Replace clutch release bearing.
10.12 Remove and replace truck transmission.
10.13 Rebuild manual transmission.
10.14 Adjust linkage.
10.15 Remove and replace power shift torque converter.
10.16 Rebuild torque converter.
10.17 Remove and replace power shift transmission.
10.18 Rebuild power shift transmission.
10.19 Adjust linkage on power shift transmission.

11.0 MAINTAIN, TROUBLESHOOT AND REPAIR DIFFERENTIALS, FINAL DRIVES, AND DRIVELINES--The student will be able to:

11.01 Remove and replace sprocket assembly with seals.
11.02 Remove and replace final drive assembly.
11.03 Remove, replace and adjust bevel gear and shaft.
11.04 Set bevel gear and pinion clearance.
11.05 Inspect drive shaft for correct timing.
11.06 Replace universal joints.
11.07 Adjust ring gear shaft for correct bearing preload.
11.08 Adjust pinion shaft for correct bearing preload.
11.09 Adjust pinion shaft for correct bearing alignment depth.
11.10 Adjust ring gear to pinion clearance.

12.0 INSPECT AND REPAIR CHASSIS--The student will be able to:

12.01 Demonstrate general knowledge of chassis damage assessment and repairs verbally or by written examination.

13.0 TEST DRIVE EQUIPMENT--The student will be able to:

13.01 Identify needed repairs to the instructor from test driving equipment where liability and safety allow such tests.

14.0 DEMONSTRATE ABILITY TO PERFORM PREVENTATIVE MAINTENANCE AND COMPLETE OIL ANALYSIS PROGRAM--The student will be able to:

14.01 Student must check all fluids, air, electrical systems, undercarriage components etc. and perform needed service or repair to the satisfaction of the instructor.
14.02 Student must demonstrate ability to remove oil sample for oil analysis.
14.03 Student must be able to explain the importance of the oil analysis verbally or by written exam.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job interview.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK   PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION   EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Heavy Equipment Operation

CODE NUMBER: Secondary _______   Postsecondary TRA0860

Florida CIP IN49.020200

SECONDARY SCHOOL CREDITS ______   COLLEGE CREDITS ______   POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational   x   Other 13-17

CERTIFICATION COVERAGE: OPER ENGR 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment with occupational titles as operating engineers, bull dozer operators, scraper operators, or to provide supplemental training for persons previously or currently employed in these occupations. Students may elect to train on individual machines of their choice as a certification option.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and skills to operate and maintain a variety of heavy equipment as crawler tractors, motor graders, scrapers and shovels or cranes. Stuidents training on one machine must complete all related program content.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in digging, ditching, sloping, stripping, grading, backfilling, clearing, excavating, and equipment maintenance.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 6.0, Language 6.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of completing this program in its entirety for the average achieving student is 1440 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate understanding of procedures.
02. Demonstrate understanding of operation and maintenance of mechanical systems and engines.
03. Operate pneumatic and crawler-type tractor with attachments.
04 Operate a back hoe.
05. Operate a motor grader.
06. Operate a crane.
07. Utilize utility construction equipment as applicable.
08. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS | EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education | SECONDARY NUMBER: ________

PROGRAM TITLE: Heavy Equipment Operation | POSTSECONDARY NUMBER: TRA0860

01.0 DEMONSTRATE UNDERSTANDING OF PROCEDURES--The student will be able to:

01.01 Apply safety practices during operation of heavy equipment.
01.02 Discuss function of each piece of heavy equipment as appropriate.
01.03 Turn and back-up equipment safely.
01.04 Operate equipment on roadway safely.

02.0 DEMONSTRATE UNDERSTANDING OF OPERATION AND MAINTENANCE OF MECHANICAL SYSTEMS AND ENGINES--The student will be able to:

02.01 Perform preventive maintenance on equipment including greasing, changing oil, and replacing filters.
02.02 Perform additional maintenance based on specific equipment needs.
02.03 Safety check equipment prior to operation.

03.0 OPERATE PNEUMATIC AND CRAULER-TYPE TRACTOR WITH ATTACHMENTS--The student will be able to:

03.01 Move, level, and spread top soil.
03.02 Remove stumps.
03.03 Pile debris for burning.
03.04 Remove and replace dozer blade.
03.05 Remove and replace bucket.
03.06 Attach cutting teeth as needed.
03.07 Safely load dump trucks.

04.0 OPERATE BACK HOE--The student will be able to:

04.01 Dig pit to specified grade.
04.02 Observe for cables, pipes, and underground utilities.
04.03 Dig ditches for drainage and pipes.
04.04 Install bucket teeth to back hoe

05.0 OPERATE A MOTOR GRADER--The student will be able to:

05.01 Grade to specific levels.
05.02 Apply use of grading stakes when operating motor grade.
05.03 Build a road-bed.
05.04 Perform blue-top grade (finish).
05.05 Change blade and scariffer teeth on motor grader.

06.0 OPERATE A CRANE--The student will be able to:

06.01 Apply crane safety procedures.
06.02 Review Construction Industry Manufactures Association safety manuals.
06.03 Operate crane with drag bucket, clam-shell, and hook.
06.04 Load dump truck with crane.

07.0 UTILIZE UTILITY CONSTRUCTION EQUIPMENT AS APPLICABLE--The student will be able to:

07.01 Operate scraper.
07.02 Operate trencher.
07.03 Operate tar kettle.
07.04 Operate rollers.
07.05 Operate concrete mixer.

08.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

08.01 Conduct a job search.
08.02 Secure information about a job.
08.03 Identify documents which may be required when applying for a job interview.
08.04 Complete a job application form correctly.
08.05 Demonstrate competence in job interview techniques.
08.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
08.07 Identify acceptable work habits.
08.08 Demonstrate knowledge of how to make job changes appropriately.
08.09 Demonstrate acceptable employee health habits.

CURRICULUM FRAMEWORK — PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION — EFFECTIVE DATE: July, 1987

COURSE TITLE: Industrial Cooperative Education-OJT

CODE NUMBER: Secondary 8700400 Postsecondary ETI0949

Florida CIP IN46.9999CP

SECONDARY SCHOOL CREDITS Multiple COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

___ Postsecondary Vocational X Other 10-12, 13-14, 16-17, 21

CERTIFICATION COVERAGE: ANY IND EDUCATION LEVEL 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this course is to provide the on-the-job training component when the cooperative method of instruction is used to prepare students for employment in industrial occupations. On-the-job experiences are provided as a part of a job preparatory program which will develop occupational competencies required for employment in the occupation chosen by the student as a career choice or to provide experiences that further develop the competencies acquired by the student in an in-school job preparatory program.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, related instruction when applicable, and competencies required for the chosen occupation.

II. LABORATORY ACTIVITIES: Training at a job site is an integral part of this course . Students learn and/or reinforce specified competencies to attain job skills to meet industry standards and to meet specific program standards.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc. is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional course .

New and emerging industrial occupations, as well as existing industrial occupations, can be served in this program utilizing one of several options.

Instructors should refer to the ICE Coordinator's Handbook and Program Guide (forthcoming) for detailed acceptable program management information.

The cooperative method of instruction is utilized for this course and the following is required for each student: a training plan signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed. The teacher and coordinator must visit each job site a minimum of once during each grading period for the purpose of evaluating the students' progress in attaining the competencies listed in the training plan.

The Cooperative - OJT course may be taken by a student for one or more semesters. A student may earn multiple credits in this course. The specific student performance standards which the student must achieve to earn credit must be specified in the OJT training plan.

*The number of credits for a particular student will depend upon the chosen occupation and training plan.

The typical length of this course for the average student will depend upon the chosen occupation and training plan.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After sucessfully completing this course , the individual will be able to:

01. Demonstrate job related skills for the chosen occupation.
02. Demonstrate an understanding of entrepreneurship.
03. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS

PROGRAM AREA: Industrial Education

COURSE TITLE: Industrial Cooperative Education - OJT

EFFECTIVE DATE: JULY, 1987

SECONDARY NUMBER: 8700400

POSTSECONDARY NUMBER: ETI0949

01.0 DEMONSTRATE JOB RELATED SKILLS FOR THE CHOSEN OCCUPATION--The student will be able to:

01.01 Demonstrate competencies from appropriate curriculum frameworks/student performance standards, as identified in the student training plan.

02.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

02.01 Define entrepreneurship.
02.02 Describe the importance of entrepreneurship to the American economy.
02.03 List the advantages and disadvantages of business ownership.
02.04 Identify the risks involved in ownership of a business.
02.05 Identify the necessary personal characteristics of a successful entrepreneur.
02.06 Identify the business skills needed to operate a small business efficiently and effectively.

03.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

03.01 Conduct a job search.
03.02 Secure information about a job.
03.03 Identify documents which may be required when applying for a job interview.
03.04 Complete a job application form correctly.
03.05 Demonstrate competence in job interview techniques.
03.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
03.07 Identify acceptable work habits.
03.08 Demonstrate knowledge of how to make job changes appropriately.
03.09 Demonstrate acceptable employee health habits.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Industrial Electricity

CODE NUMBER: Secondary 8727000 Postsecondary ______

Florida CIP IN47.013902

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVELS(S): ___7-9 ___9-12 ___ Postsecondary Adult Vocational

___Postsecondary Vocational x Other 10-12, 21

CERTIFICATION COVERAGE: ELECTRICAL 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as electricians (826.361-010), electrician helpers (829.684-022), electrical maintenance helpers, industrial electricians, maintenance electricians, or to provide supplemental training for persons previously or currently employed in these occupations.

This program includes some of the competencies applicable to the common core of electronics program, and are identified by the designation (CE) The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, assembly, installation, operation, maintenance and repair of electrical equipment used in industry and manufacturing.

Listed below are the courses that comprise this program when offered at the secondary level:

8727010	Industrial Electricity 1
8727020	Industrial Electricity 2
8727030	Industrial Electricity 3
8727040	Industrial Electricity 4
8727050	Industrial Electricity 5
8727060	Industrial Electricity 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in residential, commercial, and industrial wiring; servicing, maintaining, and using equipment, including lighting, conduit (raceway) systems, motors and related equipment following the National Electrical Code.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communicatons, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the students' individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in laboratory practices.
02. Demonstrate proficiency in DC circuits.
03. Demonstrate proficiency in AC circuits.
04. Demonstrate industrial wiring skills.
05. Install transformers.
06. Operate AC and DC rotating equipment.
07. Construct control circuits and install electrical controls and devices.
08. Repair motors.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepeneurship.

STUDENT PERFORMANCE STANDARDS
PROGRAM AREA: Industrial
PROGRAM TITLE: Industrial Electricity

EFFECTIVE DATE: July, 1987
SECONDARY NUMBER: 8727000
POSTSECONDARY NUMBER: ______

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES--The student will be able to:

01.01 Apply laboratory policies and procedures
01.02 Apply laboratory safety rules and procedures
01.03 Demonstrate the operation of laboratory safety devices
01.04 Demonstrate personal safety procedures
01.05 Demonstrate first aid/emergency treatment procedures
01.06 Apply fire safety rules and procedures
01.07 Apply electrical safety rules and procedures
01.08 Demonstrate procedures for disaster situations
01.09 Solve problems requiring addition, subtraction, multiplication and division of whole numbers
01.10 Solve problems requiring addition, subtraction, multiplication and division of common fractions
01.11 Solve problems requiring addition, subtraction, multiplication and division of decimal numbers
01.12 Convert decimals to fractions and fractions to decimals
01.13 Convert English measure to metric measure and metric measure to English measure
01.14 Solder and desolder components
01.15 Drill holes in metal or plastic chassis
01.16 Measure voltage in a simple circuit
01.17 Measure amperage in a simple circuit
01.18 Measure resistance in a simple circuit
01.19 Produce a voltage by chemical means
01.20 Produce a voltage by mechanical means
01.21 Produce a voltage by thermal means
01.22 Produce a voltage by photoelectric means
01.23 Identify physical and mechanical abilities of the electrical trade
01.24 Demonstrate use & care of ladders
01.25 Demonstrate use & care of tools
01.26 Demonstrate use of shovels & axes
01.27 Prepare a trench for conduit
01.28 Backfill and compact a conduit trench
01.29 Organize storage areas on site
01.30 Demonstrate service truck loading procedures
01.31 Perform daily maintenance on service trucks
01.32 Demonstrate rigging procedures using ropes, cables, and chains
01.33 Identify use of rigging hand signals for crane operators

02.0 DEMONSTRATE PROFICIENCY IN DC CIRCUITS--The student will be able to:

02.01 Solve basic algebraic problems as applicable to electricity/electronics (prerequisite to DC)(CE)
02.02 Relate electricity to the nature of matter(CE)
02.03 Identify sources of electricity(CE)
02.04 Define voltage, current, resistance, power, and energy(CE)
02.05 Apply and relate Ohm's Law(CE)
02.06 Measure properties of a circuit using VOM and DVM meters(CE)
02.07 Compute and measure conductance and resistance of conductors and insulators(CE)
02.08 Analyze series circuits(CE)
02.09 Construct series circuits(CE)
02.10 Troubleshoot series circuits(CE)
02.11 Draw a series circuit and calculate circuit values
02.12 Analyze parallel circuits(CE)
02.13 Construct parallel circuits(CE)
02.14 Troubleshoot parallel circuits(CE)
02.15 Draw a parallel circuit and calculate circuit values
02.16 Analyze series-parallel circuits(CE)
02.17 Construct series-parallel circuits(CE)
02.18 Troubleshoot series-parallel circuits(CE)
02.19 Draw a series-parallel circuit and calculate circuit values

02.20 Define magnetic properties of circuits and devices(CE)
02.21 Determine physical and electrical characteristics of capacitors and inductors(CE)
02.22 Set up and operate a VOM for DC circuits(CE)
02.23 Set up and operate a DVM for DC circuits(CE)
02.24 Set up and operate power supplies for DC circuits(CE)
02.25 Construct an electromagnet
02.26 Construct a simple DC generator
02.27 Construct a simple DC motor

03.0 DEMONSTRATE PROFICIENCY IN AC CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electricity/electronics (prerequisite to AC)(CE)
03.02 Identify properties of an AC signal(CE)
03.03 Identify AC sources(CE)
03.04 Analyze and apply principles of transformers to AC circuits(CE)
03.05 Analyze polyphase circuits(CE)
03.06 Construct polyphase circuits(CE)
03.07 Troubleshoot polyphase circuits(CE)
03.08 Analyze basic motor theory and operation(CE)
03.09 Analyze basic generator theory and operation(CE)
03.10 Set up and operate a VOM for AC circuits(CE)
03.11 Set up and operate a DVM for AC circuits(CE)
03.12 Set up and operate power supplies for AC circuits(CE)

04.0 DEMONSTRATE INDUSTRIAL WIRING SKILLS--The student will be able to:

04.01 Obtain electrical wiring installation requirements from an industrial electrical plan/drawing
04.02 Draw an industrial electrical floor plan
04.03 Charge a lead-acid battery
04.04 Charge a nickle-cadmium battery
04.05 Repair an emergency lighting system
04.06 Install circuit breakers in a panel board
04.07 Install a circuit using non-metallic sheathed cable
04.08 Install and connect system grounds
04.09 Install a distribution panel board
04.10 Install electrical metallic tubing
04.11 Install explosion-proof equipment
04.12 Install power and controls for A/C systems
04.13 Install a fluorescent lighting fixture
04.14 Install an incandescent lighting fixture
04.15 Install a lighting dimmer system
04.16 Install liquid-tight flexible metal conduit
04.17 Install multi-conductor cable
04.18 Install a multi-conduit layout
04.19 Install a multi-control lighting circuit
04.20 Install non-liquid-tight flexible metal conduit
04.21 Install plastic conduit
04.22 Install rigid conduit
04.23 Install the service-entrance head for a service drop
04.24 Install underfloor duct work
04.25 Install an underground service entrance
04.26 Prepare an equipment and material list
04.27 Complete an equipment and material order
04.28 Receive an equipment and material order
04.29 Install thin wall (EMT) conduit
04.30 Install a single phase receptacle circuit
04.31 Install a three phase receptacle circuit
04.32 Comply with basic National Electrical Code requirements

05.0 INSTALL TRANSFORMERS--The student will be able to:

05.01 Connect a single-phase step-down transformer
05.02 Connect a single-phase step-up transformer
05.03 Connect two single-phase transformers in parallel
05.04 Connect two single-phase transformers in an open-delta configuration

05.05 Connect a dual-voltage transformer (for high-voltage input and output)
05.06 Connect a dual-voltage transformer (for low-voltage input and output)
05.07 Connect an auto-transformer to give a variety of output voltages
05.08 Connect a single-phase distribution transformer to supply 115 and 230 volts
05.09 Connect a three-phase power transformer for a three-phase, four-wire connection
05.10 Connect a three-phase transformer for a three-phase, delta configuration
05.11 Connect a three-phase power transformer for a three-phase, wye configuration
05.12 Connect three single-phase transformers to form a delta-delta configuration
05.13 Connect three single-phase transformers to form a delta-star configuration
05.14 Connect three single-phase transformers to form a star-delta three-phase configuration
05.15 Connect three single-phase transformers to form a star-star, three-phase configuration
05.16 Install a current transformer and measure current flow
05.17 Install a potential transformer and measure voltage
05.18 Connect a booster transformer
05.19 Connect a bucking transformer

06.0 OPERATE AC AND DC ROTATING EQUIPMENT--The student will be able to:

06.01 Connect a DC shunt motor
06.02 Connect a DC series motor
06.03 Connect a DC compound motor
06.04 Connect a DC separately-excited shunt generator
06.05 Connect a DC self-excited shunt generator
06.06 Connect a DC compound generator
06.07 Connect a DC series generator
06.08 Connect a capacitor-start motor
06.09 Connect a split-phase induction motor
06.10 Connect a capacitor-run motor
06.11 Connect a universal motor
06.12 Connect a repulsion-start, induction-run motor
06.13 Connect a three-phase wound-rotor induction motor
06.14 Connect a three-phase squirrel-cage induction motor
06.15 Connect a three-phase synchronous motor
06.16 Connect a three-phase alternator

07.0 CONSTRUCT CONTROL CIRCUITS AND INSTALL ELECTRICAL CONTROLS AND DEVICES--The student will be able to:

07.01 Draw an elementary motor-control line diagram
07.02 Install a manual motor-control station
07.03 Install an automatic, push-button motor-control station
07.04 Install a three-phase-control magnetic starter
07.05 Install a two-station, push-button control station
07.06 Install a drum-switch control station
07.07 Install a control circuit to change the direction of rotation of a motor
07.08 Install a hands-off, automatic control circuit
07.09 Install a multiple push-button station
07.10 Install an interlocking/reversing control circuit
07.11 Install a hand-sequence control circuit
07.12 Install an AC reduced-voltage starter (resistance)
07.13 Install a part-winding starter
07.14 Install a three-phase multispeed controller
07.15 Install a direct-current motor controller

08.0 REPAIR MOTORS--The student will be able to:

08.01 Disassemble and assemble a DC motor
08.02 Disassemble and assemble a single-phase motor

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08.03 Disassemble and assemble a three-phase motor
08.04 Install and connect a motor starting switch
08.05 Install a motor centrifugal mechanism
08.06 Install motor bearings and bushings
08.07 Troubleshoot and repair a DC motor
08.08 Troubleshoot and repair a single-phase motor
08.09 Troubleshoot and repair a three-phase motor

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search
09.02 Secure information about a job
09.03 Identify documents that may be required when applying for a job
09.04 Complete a job application form correctly
09.05 Demonstrate competence in job interview techniques
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
09.07 Identify acceptable work habits
09.08 Demonstrate knowledge of how to make job changes appropriately
09.09 Demonstrate acceptable employee health habits

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American econom
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of s successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

NOTE: The competency statements ending with (CE) are the same as the commom core of electronics competencies.

STUDENT PERFORMANCE STANDARDS

PROGRAM AREA:	Industrial	EFFECTIVE DATE:	July, 1987
PROGRAM TITLE:	Industrial Electricity	COURSE CREDIT:	1
COURSE TITLE:	Industrial Electricity 1	PROGRAM NUMBER:	8727000
		COURSE NUMBER:	8727010

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing basic electrical skills with emphasis on developing proficiency in circuits and in laboratory practices.

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES--The student will be able to:

01.01 Apply laboratory policies and procedures
01.02 Apply laboratory safety rules and procedures
01.03 Demonstrate the operation of laboratory safety devices
01.04 Demonstrate personal safety procedures
01.05 Demonstrate first aid/emergency treatment procedures
01.06 Apply fire safety rules and procedures
01.07 Apply electrical safety rules and procedures
01.08 Demonstrate procedures for disaster situations
01.09 Solve problems requiring addition, subtraction, multiplication and division of whole numbers
01.10 Solve problems requiring addition, subtraction, multiplication and division of common fractions
01.11 Solve problems requiring addition, subtraction, multiplication and division of decimal numbers
01.12 Convert decimals to fractions and fractions to decimals
01.13 Convert English measure to metric measure and metric measure to English measure
01.14 Solder and desolder components
01.15 Drill holes in metal or plastic chassis
01.16 Measure voltage in a simple circuit
01.17 Measure amperage in a simple circuit
01.18 Measure resistance in a simple circuit
01.19 Produce a voltage by chemical means
01.20 Produce a voltage by mechanical means
01.21 Produce a voltage by thermal means
01.22 Produce a voltage by photoelectric means
01.23 Identify physical and mechanical abilities of the electrical trade
01.24 Demonstrate use & care of ladders
01.25 Demonstrate use & care of tools
01.26 Demonstrate use of shovels & axes
01.27 Prepare a trench for conduit
01.28 Backfill and compact a conduit trench
01.29 Organize storage areas on site
01.30 Demonstrate service truck loading procedures
01.31 Perform daily maintenance on service trucks
01.32 Demonstrate rigging procedures using ropes, cables, and chains
01.33 Identify use of rigging hand signals for crane operators

02.0 DEMONSTRATE PROFICIENCY IN DC CIRCUITS--The student will be able to:

02.01 Solve basic algebraic problems as applicable to electricity/electronics (prerequisite to DC)(CE)
02.02 Relate electricity to the nature of matter(CE)
02.03 Identify sources of electricity(CE)
02.04 Define voltage, current, resistance, power, and energy(CE)
02.05 Apply and relate Ohm's Law(CE)
02.06 Measure properties of a circuit using VOM and DVM meters(CE)
02.07 Compute and measure conductance and resistance of conductors and insulators(CE)
02.08 Analyze series circuits(CE)
02.09 Construct series circuits(CE)
02.10 Troubleshoot series circuits(CE)

02.11 Draw a series circuit and calculate circuit values
02.12 Analyze parallel circuits(CE)
02.13 Construct parallel circuits(CE)
02.14 Troubleshoot parallel circuits(CE)
02.15 Draw a parallel circuit and calculate circuit values
02.16 Analyze series-parallel circuits(CE)
02.17 Construct series-parallel circuits(CE)
02.18 Troubleshoot series-parallel circuits(CE)
02.19 Draw a series-parallel circuit and calculate circuit values
02.20 Define magnetic properties of circuits and devices(CE)
02.21 Determine physical and electrical characteristics of capacitors and inductors(CE)
02.22 Set up and operate a VOM for DC circuits(CE)
02.23 Set up and operate a DVM for DC circuits(CE)
02.24 Set up and operate power supplies for DC circuits(CE)
02.25 Construct an electromagnet
02.26 Construct a simple DC generator
02.27 Construct a simple DC motor

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Industrial Electricity
PROGRAM NUMBER: 8727000
COURSE TITLE: Industrial Electricity 2
COURSE NUMBER: 8727020

COURSE DESCRIPTION:

This course is designed to provide instruction in developing proficiency in AC circuits.

03.0 DEMONSTRATE PROFICIENCY IN AC CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electricity/electronics (prerequisite to AC)(CE)
03.02 Identify properties of an AC signal(CE)
03.03 Identify AC sources(CE)
03.04 Analyze and apply principles of transformers to AC circuits(CE)
03.05 Analyze polyphase circuits(CE)
03.06 Construct polyphase circuits(CE)
03.07 Troubleshoot polyphase circuits(CE)
03.08 Analyze basic motor theory and operation(CE)
03.09 Analyze basic generator theory and operation(CE)
03.10 Set up and operate a VOM for AC circuits(CE)
03.11 Set up and operate a DVM for AC circuits(CE)
03.12 Set up and operate power supplies for AC circuits(CE)

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Industrial Electricity
PROGRAM NUMBER: 8727000
COURSE TITLE: Industrial Electricity 3
COURSE NUMBER: 8727030

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for demonstrating industrial wiring skills.

04.0 DEMONSTRATE INDUSTRIAL WIRING SKILLS--The student will be able to:

04.01 Obtain electrical wiring installation requirements from an industrial electrical plan/drawing

04.02 Draw an industrial electrical floor plan
04.03 Charge a lead-acid battery
04.04 Charge a nickle-cadmium battery
04.05 Repair an emergency lighting system
04.06 Install circuit breakers in a panel board
04.07 Install a circuit using non-metallic sheathed cable
04.08 Install and connect system grounds
04.09 Install a distribution panel board
04.10 Install electrical metallic tubing
04.11 Install explosion-proof equipment
04.12 Install power and controls for A/C systems
04.13 Install a fluorescent lighting fixture
04.14 Install an incandescent lighting fixture
04.15 Install a lighting dimmer system
04.16 Install liquid-tight flexible metal conduit
04.17 Install multi-conductor cable
04.18 Install a multi-conduit layout
04.19 Install a multi-control lighting circuit
04.20 Install non-liquid-tight flexible metal conduit
04.21 Install plastic conduit
04.22 Install rigid conduit
04.23 Install the service-entrance head for a service drop
04.24 Install underfloor duct work
04.25 Install an underground service entrance
04.26 Prepare an equipment and material list
04.27 Complete an equipment and material order
04.28 Receive an equipment and material order
04.29 Install thin wall (EMT) conduit
04.30 Install a single phase receptacle circuit
04.31 Install a three phase receptacle circuit
04.32 Comply with basic National Electrical Code requirements

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STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1987
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Industrial Electricity	PROGRAM NUMBER:	8727000
COURSE TITLE:	Industrial Electricity 4	COURSE NUMBER:	8727040

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for installing transformers.

05.0 INSTALL TRANSFORMERS--The student will be able to:

05.01 Connect a single-phase step-down transformer
05.02 Connect a single-phase step-up transformer
05.03 Connect two single-phase transformers in parallel
05.04 Connect two single-phase transformers in an open-delta configuration
05.05 Connect a dual-voltage transformer (for high-voltage input and output)
05.06 Connect a dual-voltage transformer (for low-voltage input and output)
05.07 Connect an auto-transformer to give a variety of output voltages
05.08 Connect a single-phase distribution transformer to supply 115 and 230 volts
05.09 Connect a three-phase power transformer for a three-phase, four-wire connection
05.10 Connect a three-phase transformer for a three-phase, delta configuration
05.11 Connect a three-phase power transformer for a three-phase, wye configuration
05.12 Connect three single-phase transformers to form a delta-delta configuration

05.13 Connect three single-phase transformers to form a delta-star configuration
05.14 Connect three single-phase transformers to form a star-delta three-phase configuration
05.15 Connect three single-phase transformers to form a star-star, three-phase configuration
05.16 Install a current transformer and measure current flow
05.17 Install a potential transformer and measure voltage
05.18 Connect a booster transformer
05.19 Connect a bucking transformer

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Industrial Electricity

PROGRAM NUMBER: 8727000

COURSE TITLE: Industrial Electricity 5

COURSE NUMBER: 8727050

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for operating AC and DC rotating equipment, constructing control circuits, and installing control circuits, particularly electrical control circuits and devices.

06.0 OPERATE AC AND DC ROTATING EQUIPMENT--The student will be able to:

06.01 Connect a DC shunt motor
06.02 Connect a DC series motor
06.03 Connect a DC compound motor
06.04 Connect a DC separately-excited shunt generator
06.05 Connect a DC self-excited shunt generator
06.06 Connect a DC compound generator
06.07 Connect a DC series generator
06.08 Connect a capacitor-start motor
06.09 Connect a split-phase induction motor
06.10 Connect a capacitor-run motor
06.11 Connect a universal motor
06.12 Connect a repulsion-start, induction-run motor
06.13 Connect a three-phase wound-rotor induction motor
06.14 Connect a three-phase squirrel-cage induction motor
06.15 Connect a three-phase synchronous motor
06.16 Connect a three-phase alternator

07.0 CONSTRUCT CONTROL CIRCUITS AND INSTALL ELECTRICAL CONTROLS AND DEVICES--The student will be able to:

07.01 Draw an elementary motor-control line diagram
07.02 Install a manual motor-control station
07.03 Install an automatic, push-button motor-control station
07.04 Install a three-phase-control magnetic starter
07.05 Install a two-station, push-button control station
07.06 Install a drum-switch control station
07.07 Install a control circuit to change the direction of rotation of a motor
07.08 Install a hands-off, automatic control circuit
07.09 Install a multiple push-button station
07.10 Install an interlocking/reversing control circuit
07.11 Install a hand-sequence control circuit
07.12 Install an AC reduced-voltage starter (resistance)
07.13 Install a part-winding starter
07.14 Install a three-phase multispeed controller
07.15 Install a direct-current motor controller

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1987
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Industrial Electricity	PROGRAM NUMBER:	8727000
COURSE TITLE:	Industrial Electricity 6	COURSE NUMBER:	8727060

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for repairing motors and in developing employability skills and entrepreneurship.

08.0 REPAIR MOTORS--The student will be able to:

08.01 Disassemble and assemble a DC motor
08.02 Disassemble and assemble a single-phase motor
08.03 Disassemble and assemble a three-phase motor
08.04 Install and connect a motor starting switch
08.05 Install a motor centrifugal mechanism
08.06 Install motor bearings and bushings
08.07 Troubleshoot and repair a DC motor
08.08 Troubleshoot and repair a single-phase motor
08.09 Troubleshoot and repair a three-phase motor

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search
09.02 Secure information about a job
09.03 Identify documents that may be required when applying for a job
09.04 Complete a job application form correctly
09.05 Demonstrate competence in job interview techniques
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
09.07 Identify acceptable work habits
09.08 Demonstrate knowledge of how to make job changes appropriately
09.09 Demonstrate acceptable employee health habits

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of s successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

NOTE: The competency statements ending with (CE) are the same as the commom core of electronics competencies.

CURRICULUM FRAMEWORK

PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION

EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Industrial Electronics

CODE NUMBER: Secondary ______ Postsecondary EST0100

Florida CIP IN47.010500

SECONDARY SCHOOL CREDITS _____ COLLEGE CREDITS _____ POSTSECONDARY ADULT VOCATIONAL CREDITS _____

APPLICABLE LEVELS(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 13-17

CERTIFICATION COVERAGE: ELECTRONIC 7 RADIO TV @ 7

I. MAJOR CONCEPTS/CONTENT: The program is designed to prepare individuals for employment as electronics technicians, any industry (003.161-014), electronics technicians, industrial (003.161-014), electronics technicians, field service engineer, engineering assistant (003.161-014), or in related occupations in electronics.

This program includes all the competencies applicable to the secondary program of the common core of electronics, as well as some additional electronics competencies. This program does not address the skills appropriate to industrial plant maintenance. Industrial plant maintenance competencies are identified in the Industrial Electricity, Electromechanical Technology, and Industrial Machinery Maintenance and Repair programs. This program prepares individuals to assemble, install, operate, maintain, troubleshoot, and repair electrical/electronic equipment used in industry.

Graduates of this program will be prepared to enter advanced postsecondary training and education in specialized electronics-related fields. They may also be employed as trainees in various electronics-related positions in certain industries.

The content includes, but is not limited to, DC circuits, AC circuits, solid-state devices, analog circuits, digital devices, and microprocessors. Integrated into this content will be communications skills, leadership skills, human relations skills, employability skills, safe and efficient work practices, use of circuit diagrams and schematics, soldering and chassis assembly techniques, laboratory practices, and technical recording and reporting.

II. LABORATORY ACTIVITIES: Electronic laboratory activities are an integral part of this program. The tools, test equipment, materials, and processes used in this laboratory are similar to those used in industry. Students should be able to use the various types of precision test equipment found in general use throughout the electronics industry for the purpose of analyzing, troubleshooting, and repairing electronic circuitry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communications, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this program.

Instruction in microcomputer familiarization is appropriate for inclusion in this program. Instruction in entrepreneurship is also appropriate for inclusion in this program.

Algebra is recommended as a prerequisite for entry into this program.

The common core of electronics competencies are identified with the designation (CE).

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

IV. INTENDED OUTCOMES: After sucessfully completing this program, the individual will be able to:

01. Demonstrate proficiency in laboratory practices.
02. Demonstrate proficiency in DC circuits.
03. Demonstrate proficiency in AC circuits.
04. Demonstrate proficiency in solid-state devices.
05. Demonstrate proficiency in analog circuits.
06. Demonstrate proficiency in digital devices.
07. Demonstrate proficiency in microprocessing.
08. Demonstrate proficiency in technical recording and reporting.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ____

PROGRAM TITLE: Industrial Electronics POSTSECONDARY NUMBER: EST0100

This program includes all the competencies applicable to the secondary program of the common core of electronics, as well as some additional electronics competencies.

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES--The student will be able to:

01.01 Apply proper OSHA safety standards (CE).
01.02 Make electrical connections (CE).
01.03 Identify and use hand tools properly (CE).
01.04 Identify and use power tools properly (CE).
01.05 Demonstrate acceptable soldering and desoldering techniques (CE).

02.0 DEMONSTRATE PROFICIENCY IN DC CIRCUITS--The student will be able to:

02.01 Solve algebraic problems to include exponentials (prerequisite to DC) (CE).
02.02 Relate electricity to the nature of matter (CE).
02.03 Identify sources of electricity (CE).
02.04 Define voltage, current, resistance, power, and energy (CE).
02.05 Apply and relate Ohm's law (CE).
02.06 Read and interpret color codes and symbols to identify electrical components and values (CE).
02.07 Measure properties of a circuit using VOM and DVM meters (CE).
02.08 Compute and measure conductance and resistance of conductors and insulators (CE).
02.09 Apply Ohm's law to series circuits (CE).
02.10 Construct and verify operation of series circuits (CE).
02.11 Troubleshoot series circuits (CE).
02.12 Apply Ohm's law to parallel circuits (CE).
02.13 Construct and verify the operation of parallel circuits (CE).
02.14 Troubleshoot parallel circuits (CE).
02.15 Apply Ohm's law to series-parallel circuits (CE).
02.16 Construct and verify the operation of series-parallel circuits (CE).
02.17 Troubleshoot series-parallel circuits (CE).
02.18 Identify and define voltage divider circuits (loaded and unloaded) (CE).
02.19 Construct and verify the operation of voltage divider circuits (loaded and unloaded) (CE).
02.20 Troubleshoot voltage divider circuits (loaded and unloaded) (CE).
02.21 Apply maximum power theory (CE).
02.22 Construct and verify the operation of DC circuits that demonstrate the maximum power transfer theory (CE).
02.23 Define magnetic properties of circuits and devices (CE).
02.24 Determine the physical and electrical characteristics of capacitors and inductors (CE).
02.25 Define RC and RL time constants and classify the output of differentiators and integrators (CE).
02.26 Construct and verify the operation of differentiators and integrators to determine RC and RL time constants (CE).
02.27 Troubleshoot differentiator and integrator circuits (CE).
02.28 Set up and operate a VOM for DC circuits (CE).
02.29 Set up and operate a DVM for DC circuits (CE).
02.30 Set up and operate power supplies for DC circuits (CE).
02.31 Set up and operate oscilloscopes for DC circuits (CE).

03.0 DEMONSTRATE PROFICIENCY IN AC CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electronics (prerequisite to AC) (CE).
03.02 Identify properties of an AC signal (CE).
03.03 Identify AC sources (CE).
03.04 Analyze and measure AC signals using oscilloscope, frequency meter, and generator (CE).
03.05 Define the characteristics of AC capacitive circuits (CE).
03.06 Construct and verify the operation of AC capacitive circuits (CE).
03.07 Troubleshoot AC capacitive circuits (CE).

03.08 Define the characteristics of AC inductive circuits (CE).
03.09 Construct and verify the operation of AC inductive circuits (CE).
03.10 Troubleshoot AC inductive circuits (CE).
03.11 Define and apply the principles of transformers to AC circuits (CE).
03.12 Construct and verify the operation of AC circuits utilizing transformers (CE).
03.13 Troubleshoot AC circuits utilizing transformers (CE).
03.14 Define the characteristics of RLC circuits (series, parallel, and complex) (CE).
03.15 Construct and verify the operation of RLC circuits (series, parallel, and complex) (CE).
03.16 Define the characteristics of series and parallel resonant circuits (CE).
03.17 Construct and verify the operation of series and parallel resonant circuits (CE).
03.18 Define the characteristics of filter circuits (CE).
03.19 Construct and verify the operation of filter circuits (CE).
03.20 Troubleshoot filter circuits (CE).
03.21 Define the characteristics of polyphase circuits (CE).
03.22 Define basic motor theory and operation (CE).
03.23 Define basic generator theory and operation (CE).
03.24 Set up and operate a VOM for AC circuits (CE).
03.25 Set up and operate a DVM for AC circuits (CE).
03.26 Set up and operate power supplies for AC circuits (CE).
03.27 Set up and operate oscilloscopes for AC circuits (CE).
03.28 Set up and operate frequency counters for AC circuits (CE).
03.29 Set up and operate signal generators for AC circuits (CE).
03.30 Set up and operate capacitor/inductor analyzers for AC circuits (CE).
03.31 Set up and operate impedance bridges for AC circuits (CE).

04.0 DEMONSTRATE PROFICIENCY IN SOLID-STATE DEVICES--The student will be able to:

04.01 Identify properties of semiconductor materials (CE).
04.02 Identify and define operating characteristics and applications of pn junction diodes (CE).
04.03 Identify and define operating characteristics and applications of special diodes (CE).
04.04 Analyze diode circuits (CE).
04.05 Construct diode circuits (CE).
04.06 Troubleshoot diode circuits (CE).
04.07 Identify and define operating characteristics and applications of bipolar transistors (CE).
04.08 Identify and define operating characteristics and applications of field effect transistors (FET's) (CE).
04.09 Identify and define operating characteristics and applications of thyristors (CE).
04.10 Identify and define operating characteristics and applications of integrated circuits (CE).
04.11 Set up and operate a VOM for solid-state devices (CE).
04.12 Set up and operate a DVM for solid-state devices (CE).
04.13 Set up and operate power supplies for solid-state devices (CE).
04.14 Set up and operate oscilloscopes for solid-state devices (CE).
04.15 Set up and operate frequency counters for solid-state devices (CE).
04.16 Set up and operate signal generators for solid-state devices (CE).
04.17 Set up and operate capacitor/inductor analyzers for solid-state devices (CE).
04.18 Set up and operate impedance bridges for solid-state devices (CE).
04.19 Set up and operate curve tracers (CE).
04.20 Set up and operate transistor testers (CE).

05.0 DEMONSTRATE PROFICIENCY IN ANALOG CIRCUITS--The student will be able to:

05.01 Identify and define operating characteristics and applications of single-stage amplifiers (CE).
05.02 Construct single-stage amplifiers (CE).
05.03 Troubleshoot single-stage amplifiers (CE).
05.04 Identify and define operational characteristics and applications of multistage amplifiers (CE).

05.05 Construct multistage amplifiers (CE).
05.06 Troubleshoot multistage amplifiers (CE).
05.07 Identify and define operating characteristics and applications of basic power supplies and filters (CE).
05.08 Construct basic power supplies and filters (CE).
05.09 Troubleshoot basic power supplies and filters (CE).
05.10 Identify and define operating characteristics and applications of differential and operational amplifiers (CE).
05.11 Construct differential and operational amplifiers (CE).
05.12 Troubleshoot differential and operational amplifiers (CE).
05.13 Identify and define operating characteristics and applications of power supply regulators (CE).
05.14 Construct power supply regulators (CE).
05.15 Troubleshoot power supply regulators (CE).
05.16 Identify and define operating characteristics and applications of active filters (CE).
05.17 Construct active filters (CE).
05.18 Troubleshoot active filters (CE).
05.19 Identify and define operating characteristics and applications of sinusoidal and non-sinusoidal oscillators (CE).
05.20 Construct oscillators (optional in high school and vocational center programs) (CE).
05.21 Troubleshoot oscillators (optional in high school and vocational center programs) (CE).
05.22 Identify and define operating characteristics and applications of motor phase-control circuits (single-phase and multiphase) (CE).
05.23 Identify and define operating characteristics and applications of cathode ray tubes (CRT's) as used in video terminals (CE).
05.24 Identify and define operating characteristics and applications of optical devices (CE).
05.25 Set up and operate a VOM for analog circuits (CE).
05.26 Set up and operate a DVM for analog circuits (CE).
05.27 Set up and operate power supplies for analog circuits (CE).
05.28 Set up and operate oscilloscopes for analog circuits (CE).
05.29 Set up and operate frequency counters for analog circuits (CE).
05.30 Set up and operate signal generators for analog circuits (CE).
05.31 Set up and operate impedance bridges for analog circuits (CE).

06.0 DEMONSTRATE PROFICIENCY IN DIGITAL DEVICES--The student will be able to:

06.01 Define and apply numbering systems (hex., bin., and oct.) to codes and arithmetic (CE).
06.02 Analyze/minimize logic circuits using Boolean operations (CE).
06.03 Set up and operate a VOM for digital devices (CE).
06.04 Set up and operate a DVM for digital devices (CE).
06.05 Set up and operate logic probes for digital devices (CE).
06.06 Set up and operate power supplies for digital devices and solve power distribution and noise problems (CE).
06.07 Set up and operate pulsers for digital devices (CE).
06.08 Set up and operate oscilloscopes for digital devices (CE).
06.09 Set up and operate logic analyzers for digital devices (CE).
06.10 Set up and operate pulse generators for digital devices (CE).
06.11 Set up and operate counters for digital devices (CE).
06.12 Identify types of logic gates and their truth tables (CE).
06.13 Construct logic gates using discrete components (CE).
06.14 Troubleshoot logic gates (CE).
06.15 Analyze types of flip-flops and their truth and excitation tables (CE).
06.16 Construct flip-flops using discrete components (CE).
06.17 Troubleshoot flip-flops (CE).
06.18 Identify, define, and measure characteristics of integrated circuit IC logic families (CE).
06.19 Identify types of registers and counters (CE).
06.20 Construct registers and counters using flip-flops and logic gates (CE).
06.21 Troubleshoot registers and counters (CE).
06.22 Analyze clock and timing circuits (CE).
06.23 Construct clock and timing circuits (CE).
06.24 Troubleshoot clock and timing circuits (CE).
06.25 Identify and relate types of logic-arithmetic circuits (CE).
06.26 Construct logic-arithmetic circuits (CE).
06.27 Troubleshoot logic-arithmetic circuits (CE).

06.28 Identify types of encoding and decoding devices (CE).
06.29 Construct encoders and decoders (CE).
06.30 Troubleshoot encoders and decoders (CE).
06.31 Identify types of multiplexer and demultiplexer circuits (CE).
06.32 Construct multiplexer and demultiplexer circuits (CE).
06.33 Troubleshoot multiplexer and demultiplexer circuits (CE).
06.34 Identify types of memory circuits (static, dynamic, volatile, nonvolatile, etc.) (CE).
06.35 Use memory devices in circuits (CE).
06.36 Troubleshoot memory-device circuits (CE).
06.37 Relate the uses of digital-to-analog and analog-to-digital conversions (CE).
06.38 Construct digital-to-analog and analog-to-digital circuits (CE).
06.39 Troubleshoot digital-to-analog and analog-to-digital circuits (CE).
06.40 Identify types of displays (LED, LCD, etc.) (CE).
06.41 Construct display circuits (CE).
06.42 Troubleshoot display circuits (CE).
06.43 Analyze representative digital systems appropriate to class projects designed for local industrial applications.
06.44 Design, construct, and troubleshoot representative digital systems appropriate to class projects designed for local industrial applications.
06.45 Demonstrate applications of representative digital systems appropriate to class projects designed for local industrial applications.

07.0 DEMONSTRATE PROFICIENCY IN MICROPROCESSING--The student will be able to:

07.01 Identify CPU (Architecture) building blocks and their uses (CE).
07.02 Analyze BUS concepts (CE).
07.03 Analyze various memory schemes (CE).
07.04 Set up and operate a VOM for microprocessing analysis (CE).
07.05 Set up and operate a DVM for microprocessing analysis (CE).
07.06 Set up and operate power supplies for microprocessor use (CE).
07.07 Set up and operate oscilloscopes for microprocessors (CE).
07.08 Set up and operate logic/data analyzers for microprocessor de-bug (CE).
07.09 Identify types of input and output devices and peripherals (PIA's, UART's, etc.) (CE).
07.10 Interface input and output ports (RS-232, RS-422, etc.) (CE).
07.11 Troubleshoot input and output ports (CE).
07.12 Execute computer instruction sets (CE).
07.13 Design and lay out a unique microprocessing system.
07.14 Construct a unique microprocessing application system.
07.15 Troubleshoot and demonstrate proficiency in a unique application in microprocessor systems.
07.16 Construct and troubleshoot a single-chip microprocessor system.
07.17 Construct and troubleshoot an advanced microcomputer system.

08.0 DEMONSTRATE PROFICIENCY IN TECHNICAL RECORDING AND REPORTING--The student will be able to:

08.01 Draw and interpret electronic schematics (CE).
08.02 Record data and design curves and graphs (CE).
08.03 Write reports and make oral presentations (CE).
08.04 Maintain test logs (CE).
08.05 Make equipment-failure reports (CE).
08.06 Specify and requisition simple electronic components (CE).
08.07 Compose technical letters and memoranda (CE).
08.08 Write formal reports of laboratory experiences (CE).
08.09 Draft preventive maintenance and calibration procedures (CE).

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents that may be required when applying for a job.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.

09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Industrial Machinery Maintenance and Repair

CODE NUMBER: Secondary ______ Postsecondary ETI0450

Florida CIP IN47.030300

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-17

CERTIFICATION COVERAGE: TEC CONSTR @ 7 MILLWRIGHT 7
BLDG CONST @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as millwrights (50061600), maintenance mechanics (629.280-010), machinery erectors (638.261-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, metal working skills, welding, basic machine shop functions, troubleshooting techniques, preventative maintenance programs, rigging, equipment installation, and maintenance and repair of a variety of systems found in industrial operations including drive components, piping systems, pumps, hydraulic systems, pneumatic systems, and bearings and seals.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in shop practices, rigging, equipment installation, maintenance, troubleshooting and repair of drive systems, pumps, hydraulic and pneumatic systems as well as basic welding and machine shop skills.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Read blueprints.
02. Demonstrate shop skills.
03. Use and maintain hand tools.
04. Use and maintain portable power tools.
05. Demonstrate troubleshooting skills.
06. Perform gas welding.

07. Perform arc welding.
08. Plan and set up work.
09. Demonstrate knowledge of basic electricity and electronics.
10. Demonstrate knowledge of elements of mechanics.
11. Handle and apply lubricants.
12. Install and maintain drive components.
13. Install, inspect and repair or replace bearings.
14. Perform pump maintenance and repair.
15. Maintain piping systems and accessories.
16. Maintain and repair hydraulic system components.
17. Troubleshoot hydraulic systems.
18. Maintain reciprocating, positive displacement, rotary and dynamic air compressors.
19. Troubleshoot pneumatic systems.
20. Install and maintain mechanical drives.
21. Maintain and troubleshoot fluid drive systems.
22. Maintain bearing and shaft seals.
23. Demonstrate knowledge of the operation of industrial pollution control systems.
24. Perform rigging functions.
25. Install equipment.
26. Perform machine shop turning operations.
27. Perform machine shop shaping operations.
28. Analyze machine shop jobs.
29. Perform milling operations.
30. Demonstrate employability skills.
31. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
SECONDARY NUMBER: ________

PROGRAM TITLE: Industrial Machinery Maintenance and Repair
POSTSECONDARY NUMBER: ETI0450

01.0 READ BLUEPRINTS--The student will be able to:

01.01 Explain the purpose of blueprints.
01.02 Examine and interpret machine parts and machine drawings.
01.03 Read machine assembly drawings.
01.04 Develop sketches.
01.05 Compute materials from sheet metal drawings.
01.06 Interpret building drawings.
01.07 Read and interpret schematics and symbols.
01.08 Identify common features and differences of schematics.
01.09 Identify electrical wires and connections.
01.10 Read electrical diagrams.
01.11 Identify piping systems, projection, joints, valves and symbols.
01.12 Read a piping schematic.
01.13 Identify fluid power system component symbols and interpret diagrams.
01.14 Interpret air conditioning and refrigeration system and subsystem schematics.
01.15 Identify symbols for welds.

02.0 DEMONSTRATE SHOP SKILLS--The student will be able to:

02.01 Add, multiply, subtract, and divide positive and negative numbers.
02.02 Add, subtract, multiply, and divide fractions.
02.03 Change mixed numbers to decimals and vice versa.
02.04 Compare numbers and write ratios.
02.05 Demonstrate basic understanding of geometric functions.
02.06 Solve algebraic equations.
02.07 Explain the properties of triangles.
02.08 Apply basic trigonometric functions to layout and installation situations.
02.09 Demonstrate an understanding of metric and linear measurement.
02.10 Measure bulk materials.
02.11 Explain techniques of measuring motion, forces, fluids, electricity, and temperature.
02.12 Explain mechanical and chemical properties of ferrous and non ferrous metals.
02.13 Explain industrial manufacturing processes.
02.14 Explain industrial uses of non metals including solids, liquids, and gases.
02.15 Explain the safe and proper use of toxic or flammable materials.
02.16 Demonstrate the proper use of safety and personal protection equipment.

03.0 USE AND MAINTAIN HAND TOOLS--The student will be able to:

03.01 Demonstrate the use of rules and tapes, calipers, and micrometers.
03.02 Demonstrate the use of wrenches and screwdrivers.
03.03 Demonstrate the use and care of pipefitting tools.
03.04 Use plumbing codes to determine materials.
03.05 Bend and join copper pipe.
03.06 Join cast iron pipe.
03.07 Demonstrate the use of line clearing equipment.
03.08 Bend and assemble rigid electrical conduit.
03.09 Demonstrate the use and care of test and safety equipment.
03.10 Demonstrate the use and care of woodworking tools, including saws, planes, drills, hammers, nail sets, and marking gauges.
03.11 Demonstrate the use and care of sheetmetal tools including sheet metal gauges, layout tools, dividers, punches, nibblers, riveting tools, metal-cutting chisels, metal-cutting snips, forming tools, hand seamer, and soldering irons.
03.12 Demonstrate proper metalworking bench skills including vises, hacksaws, files, taps, dies, and reamers.
03.13 Demonstrate the use of ropes, slings, pullers, and block and tackle.

04.0 USE AND MAINTAIN PORTABLE POWER TOOLS--The student will be able to:

04.01 Demonstrate the use and maintenance of light-duty and heavy-duty drills.
04.02 Demonstrate the use and maintenance of electric hammers.

04.03 Demonstrate the use and maintenance of pneumatic drills and hammers.
04.04 Demonstrate the use and maintenance of power screwdrivers, nut runners
04.05 Demonstrate the use and maintenance of linear motion saws.
04.06 Demonstrate the use and maintenance of circular saws.
04.07 Demonstrate the use and maintenance of routers and planes.
04.08 Demonstrate the use and maintenance of belt, pad, and disc sanders.
04.09 Demonstrate the use and maintenance of grinders and shears.
04.10 Sharpen tools using a bench grinder.

05.0 DEMONSTRATE TROUBLESHOOTING SKILLS--The student will be able to:

05.01 Explain the importance of maintenance.
05.02 Explain troubleshooting procedures.
05.03 Identify aids to troubleshooting.
05.04 Explain safety rules for troubleshooting and repair procedures.
05.05 Maintain records.
05.06 Use schematics and troubleshooting charts.

06.0 PERFORM GAS WELDING--The student will be able to:

06.01 Identify gas welding equipment and accessories.
06.02 Identify personal protection equipment required for welding.
06.03 Light, adjust, and shutdown a torch.
06.04 Weld mild steel.
06.05 Weld stainless steel.
06.06 Weld cast iron.
06.07 Weld non ferrous materials.
06.08 Mark and cut metal.
06.09 Braze metal.
06.10 Solder metals.
06.11 Explain capillary attraction as it applies to metal joining.

07.0 PERFORM ARC WELDING--The student will be able to:

07.01 Explain the process of shielded metal-arc welding (SMAW).
07.02 Identify and select electrodes for SMAW.
07.03 Explain the process of gas metal-arc welding (GMAW).
07.04 Explain the process of gas tungsten-arc welding (GTAW).
07.05 Explain the use of electrodes and filler metal in GTAW.
07.06 Weld cast iron with SMAW.
07.07 Weld low carbon steel with SMAW.
07.08 Weld carbon steel with GTAW.
07.09 Weld alloy steel.
07.10 Weld non-ferrous metals.
07.11 Weld pipe.
07.12 Explain the rationale of preheating and postheating metal.
07.13 Explain hard facing and rebuilding procedures.

08.0 PLAN AND SET UP WORK--The student will be able to:

08.01 Explain a process of performing a task.
08.02 Organize tools and materials to complete a task.

09.0 DEMONSTRATE KNOWLEDGE OF BASIC ELECTRICITY AND ELECTRONICS--The student will be able to:

09.01 Define electrical/electronic terms.
09.02 Explain the nature of static electricity.
09.03 Explain how to measure and reduce static electricity.
09.04 Explain the theory of magnetism.
09.05 Explain the industrial uses of magnets and electromagnets.
09.06 Explain Ohm's Law.
09.07 Measure current, resistance, and potential difference.
09.08 Select and identify resistors and capacitors.
09.09 Explain the fundamentals of DC circuits.
09.10 Explain the uses of DC circuits in motors and generators.
09.11 Explain differences between DC and AC circuits.
09.12 Explain AC sine waves using vectors to solve AC problems.
09.13 Measure power in three phase circuits.
09.14 Install electric motors.
09.15 Install transformers.
09.16 Maintain transformers.
09.17 Explain the operation of D'arsonval meters.
09.18 Measure voltage with a D'arsonval meter.
09.19 Demonstrate the core and use of digital meters.

09.20 Use a DC anmeter to measure voltage.
09.21 Measure electrical resistance.
09.22 Explain the use of thermal meters for AC measurement.
09.23 Demonstrate the use and care of oscilloscopes.
09.24 Demonstrate an understanding of electrical control equipment.
09.25 Troubleshoot control circuits.
09.26 Troubleshoot combination starters.
09.27 Troubleshoot control devices.
09.28 Troubleshoot special controls.
09.29 Troubleshoot DC motors.
09.30 Troubleshoot AC motors.
09.31 Troubleshoot lighting systems.

10.0 DEMONSTRATE A KNOWLEDGE OF ELEMENTS OF MECHANICS--The student will be able to:

10.01 Demonstrate an understanding of measuring systems and ratios.
10.02 Locate the center of gravity of a mass.
10.03 Explain working forces of torque, tension, and compression.
10.04 Explain the laws of motion.
10.05 Explain how to calculate work.
10.06 Explain the function of simple machines including levers, inclined plane, wedge wheel and axle, pulley and screw.
10.07 Explain the types of power and the method of producing power including compound gears.
10.08 Calculate volume mathematically and by displacement.
10.09 Explain the laws of friction.

11.0 HANDLE AND APPLY LUBRICANTS--The student will be able to:

11.01 Explain the functions of lubrication.
11.02 Explain the properties of oil lubricants and factors determining the selection of lubricants.
11.03 Identify the types, advantage, and functions of lubricant additives.
11.04 Explain the types of circulating oils and their purposes.
11.05 Identify grease application.
11.06 Identify lubricating systems and methods.
11.07 Explain lubricant storage and handling methods.
11.08 Lubricate a piece of industrial equipment.

12.0 INSTALL AND MAINTAIN DRIVE COMPONENTS--The student will be able to:

12.01 Install a solid coupling.
12.02 Install a jaw coupling.
12.03 Install a molded rubber coupling.
12.04 Install a chain type coupling.
12.05 Identify and install a clutch.
12.06 Install and adjust a V-belt with manually adjustable sheaves.
12.07 Install a V-belt with spring loaded adjustable sheaves.
12.08 Identify and explain the purpose and advantage of a chain drive system.
12.09 Explain the function of speed reducers.
12.10 Explain the function of gears and variable speed reducers.

13.0 INSTALL, INSPECT, AND REPAIR OR REPLACE BEARINGS--The student will be able to:

13.01 Identify common bearing types and advantages.
13.02 Remove, inspect, and replace a plain journal bearing.
13.03 Mount, square, and align antifriction bearings.
13.04 Identify specialized bearing, applications, and characteristics, including thrust bearings, self-aligning bearings, linear-motion bearings, instrument bearings, non metallic bearings, and hydrostatic bearings.
13.05 Identify and select bearing seals for specified applications.
13.06 List rules for good bearing lubrication.
13.07 Explain bearing maintenance, load, and wear patterns.

14.0 PERFORM PUMP MAINTENANCE AND REPAIR--The student will be able to:

14.01 Determine pump capacity and system requirements.
14.02 Perform pump maintenance.
14.03 Identify packing and seal requirements.
14.04 Explain operating principles of centrifugal, propeller and turbine rotary, reciprocating and metering pumps.

14.05 Disassemble and reassemble a pump.

15.0 MAINTAIN PIPING SYSTEMS AND ACCESSORIES--The student will be able to:

15.01 Identify the components of a piping system.
15.02 Explain the maintenance considerations of metallic and non metallic piping systems.
15.03 Join tubing.
15.04 Join common fittings.
15.05 Join metallic pipe.
15.06 Join plastic pipe.
15.07 Explain valve operation and maintenance.
15.08 Explain the importance of strainers, filters, and traps in piping systems.

16.0 MAINTAIN AND REPAIR HYDRAULIC SYSTEM COMPONENTS--The student will be able to:

16.01 Explain Pascal's Law.
16.02 Explain Bernoulli's Principle.
16.03 Explain how heat and pressure relate to power and transmission.
16.04 Describe the physical and chemical properties of a fluid.
16.05 Install and maintain a contaminate removal systems.
16.06 Determine reservoir requirements.
16.07 Classify and select pumps for specific applications.
16.08 Compute hose requirements.
16.09 Install hydraulic lines.
16.10 Select and install control valves.

17.0 TROUBLESHOOT HYDRAULIC SYSTEMS--The student will be able to:

17.01 Read a hydraulic schematic.
17.02 Install hydraulic components.
17.03 Connect electrically controlled valves.
17.04 Explain hydraulic system troubleshooting techniques.
17.05 Repair and replace valves.
17.06 Repair and replace cylinders.
17.07 Repair and replace pumps and motors.
17.08 Cut, flare and bend tubing.

18.0 MAINTAIN RECIPROCATING, POSITIVE DISPLACEMENT, ROTARY AND DYNAMIC AIR COMPRESSORS--The student will be able to:

18.01 Relate force, weight, mass and density to a pneumatic system.
18.02 Explain the operation of reciprocating compressors.
18.03 Explain the operation of positive-displacement rotary compressors.
18.04 Explain primary and secondary air treatment.
18.05 Explain the operation of valves, cylinders, and motors.

19.0 TROUBLESHOOT PNEUMATIC SYSTEMS--The student will be able to:

19.01 Identify common schematic symbols and diagrams.
19.02 Diagram an air supply system.
19.03 Install system components.
19.04 Explain system maintenance techniques.
19.05 Explain proper troubleshooting procedures.
19.06 Troubleshoot air compressors.
19.07 Troubleshoot control valves.
19.08 Troubleshoot, repair, and install control valves.
19.09 Troubleshoot air motors.

20.0 INSTALL AND MAINTAIN MECHANICAL DRIVES--The student will be able to:

20.01 Install and align shafts.
20.02 Mount drive sprockets and chains.
20.03 Mount sheaves and pulleys.
20.04 Install V-belts and adjust tension.
20.05 Mount and align gears on open gear drives.
20.06 Install standard shaft couplings.
20.07 Troubleshoot mechanical drive systems.
20.08 Install a mechanical clutch system.

21.0 MAINTAIN AND TROUBLESHOOT FLUID DRIVE SYSTEMS--The student will be able to:

21.01 Install adjustable speed drives.
21.02 Troubleshoot adjustable speed drives.
21.03 Explain the operation of fluid couplings.
21.04 Install fluid couplings.
21.05 Install torque converters.
21.06 Perform preventative maintenance.

22.0 MAINTAIN BEARING AND SHAFT SEALS--The student will be able to:

22.01 Explain bearing maintenance procedures.
22.02 Explain shaft seal maintenance.

23.0 DEMONSTRATE A KNOWLEDGE OF THE OPERATION OF INDUSTRIAL POLLUTION CONTROL SYSTEMS--The student will be able to:

23.01 Explain the operation of air pollution control systems.
23.02 Explain the operation of water pollution control systems.
23.03 Explain the operation of solid waste pollution control systems.
23.04 Explain the operation of noise pollution control systems.
23.05 Explain the basic philosophy of "right to know" legislation.

24.0 PERFORM RIGGING FUNCTIONS--The student will be able to:

24.01 Estimate the weight of a load.
24.02 Find the center of gravity.
24.03 Identify rigging and slings used in maintenance work.
24.04 Explain and demonstrate inspection procedures for rigging, ropes and slings for safety.
24.05 Identify rope fiber types.
24.06 Tie knots, bends, and hitches.
24.07 Whip and splice fiber line.
24.08 Identify types of wire rope.
24.09 Cut and seize wire rope.
24.10 Install wire rope eyes, sockets, and hooks.
24.11 Identify cranes and hoists.
24.12 Splice wire rope.
24.13 Erect a scaffold and install planking.
24.14 Raise a ladder.
24.15 Rig life belts and life nets.

25.0 INSTALL EQUIPMENT--The student will be able to:

25.01 Explain relocation procedures for new equipment in an existing facility.
25.02 Explain the use of anchors and isolators.
25.03 Explain procedures for moving and installing new equipment.
25.04 Explain leveling and aligning procedures.
25.05 Explain test run guidelines.
25.06 Explain safety procedures for equipment installation procedures.

26.0 PERFORM MACHINE SHOP TURNING OPERATIONS--The student will be able to:

26.01 Identify the principle parts of an engine lathe.
26.02 Demonstrate the safe and proper use of lathes and attachments.
26.03 Perform turning operations.
26.04 Perform facing operations.
26.05 Perform boring operations.
26.06 Perform drilling and reaming operations.
26.07 Perform milling operations.

27.0 PERFORM MACHINE SHOP SHAPING OPERATIONS--The student will be able to:

27.01 Identify types of milling machines.
27.02 Locate cutters.
27.03 Determine spindle speed, feed rates, and direction of feed.
27.04 Perform external shaping operations.
27.05 Perform angular shaping operations.
27.06 Perform internal shaping operations.
27.07 Demonstrate proper use of grinder.
27.08 Cut a gear.
27.09 Cut metal with a power hacksaw.

28.0 ANALYZE MACHINE SHOP JOBS--The student will be able to:

28.01 Determine sequence of work on a specified project.
28.02 Determine tolerances and finishes.
28.03 Explain the variables that affect job efficiency.

29.0 PERFORM MILLING OPERATIONS--The student will be able to:

29.01 Set up a vertical milling machine and cutters.
29.02 Slab mill a work piece.
29.03 Slot on a horizontal milling machine.
29.04 Mill keyseats.

30.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

30.01 Conduct a job search.
30.02 Secure information about a job.
30.03 Identify documents which may be required when applying for a job interview.
30.04 Complete a job application form correctly.
30.05 Demonstrate competence in job interview techniques.
30.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
30.07 Identify acceptable work habits.
30.08 Demonstrate knowledge of how to make job changes appropriately.
30.09 Demonstrate acceptable employee health habits.

31.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

31.01 Define entrepreneurship.
31.02 Describe the importance of entrepreneurship to the American economy.
31.03 List the advantages and disadvantages of business ownership.
31.04 Identify the risks involved in ownership of a business.
31.05 Identify the necessary personal characteristics of a successful entrepreneur.
31.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Industrial Plastics

CODE NUMBER: Secondary ______ Postsecondary ETM0850

Florida CIP IN48.060400

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-15

CERTIFICATION COVERAGE: IND PLASTI 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as plastic bench mechanics (754.381-018), plastic mixers (559.684-014), inspectors (559.381-010), color matchers (550.381-010), finishers (554.586-010), mold posters (556.587-010), quality control testers (559.367-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, molding and casting plastic parts, patterns, and prototype parts, and fitting, fabricating, assembling, finishing, and repairing of plastic parts and components.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in mold construction parts fabrication, assembly, and finishing; and the processes to produce both component parts and finished plastic products.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1200 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate understanding of procedures and safe work practices.
02. Read blueprints, schematics, and diagrams.
03. Draw and lay out prototype products.
04. Build molds and patterns.
05. Manufacture component parts.
06. Construct and finish plastic products.
07. Repair plastic products.
08. Use and maintain hand and power tools.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
SECONDARY NUMBER: ________

PROGRAM TITLE: Industrial Plastics
POSTSECONDARY NUMBER: ETM0850

01.0 DEMONSTRATE AN UNDERSTANDING OF PROCEDURES AND SAFE WORK PRACTICES--The student will be able to:

01.01 Demonstrate an awareness and understanding of health and safety hazards, prevention, correction and ecological problems and solution unique to quality control and reliability processes and systems.
01.02 Demonstrate an understanding of physical hazards.
01.03 Demonstrate an understanding of chemical hazards.
01.04 Demonstrate an understanding of biological and biomechanical hazards.
01.05 Demonstrate an awareness and understanding of fire hazards in manufacture, processing, and fabrication.
01.06 Demonstrate an understanding and procedures to control and extinguish NFPA classes of fire.
01.07 Demonstrate an awareness and understanding for the need and use of safety devices, controls, guards and equipment.
01.08 Demonstrate awareness, understanding and use of personal safety protection and devices including but not limited to goggles, safety glasses, masks, helmets, hearing protectors, air respirators, protective clothing, safety shoes and mesh gloves.
01.09 Demonstrate administration of first aid procedures and accident procedures.
01.10 Demonstrate an awareness and understanding of applicable OSHA rules and regulations.

02.0 READ BLUEPRINTS, SCHEMATICS, AND DIAGRAMS--The student will be able to:

02.01 Use working drawings which include detail and assembly drawings.
02.02 Demonstrate the ability to use and interpret information on exterior views, sectional views, auxiliary views, balloon drawings, pictorial drawings, exploded views, perspective drawings and projection drawings.
02.03 Demonstrate the ability to determine accuracy of information on working drawings.
02.04 Demonstrate the ability to perform mathematical calculations utilizing arithmetic, algebra, geometry and trigonometry.
02.05 Demonstrate the ability to read and convert English system and metric system measurements.
02.06 Demonstrate the ability to use decimal metric equivalents charts, tap drill sizes for American standards threads charts drill size decimal equivalent charts, American standard wrench nuts and bolts charts, mechanical fasteners charts and assembly devices charts.
02.07 Demonstrate the ability to use measuring tools and scales.
02.08 Demonstrate the ability to take off materials list from working drawings calculate totals for production.

03.0 DRAW AND LAYOUT PROTOTYPE PRODUCTS--The student will be able to:

03.01 Prepare multi-view drawings.
03.02 Prepare sectional drawings.
03.03 Prepare auxiliary.
03.04 Prepare pictorial drawings.
03.05 Prepare take-off detail drawings.
03.06 Prepare surface developments.
03.07 Prepare a complete set of working drawings including detail and assembly drawings which supply every item of information for the manufacture and assembly of the product represented.
03.08 Prepare a complete set of working drawings manually and using CAD systems. (The CAD systems drawings and program shall be capable of interfacing to drive CAD/CAM and CAMM manufacturing equipment.)
03.09 Demonstrate necessary design considerations for functional working drawings, i. e. appearance, chemical characteristics, mechanical factors, economics, process of manufacture and design limitations.

04.0 BUILD MOLDS AND PATTERNS--The student will be able to:

04.01 Demonstrate an understanding of requirements to design and apply dies, molds and patterns to the following processes: injection molding, cut extrusions, sheet moldings (vacuum forming and mechanical forming), blow moldings, slush, rotational and dip castings, compression moldings, transfer moldings, reinforced plastics moldings (contact, vacuum bag, pressure bag, autoclave, matched die, filament wound and spray molding), castings and cold moldings.
04.02 Demonstrate an understanding of appropriate materials and tools to use for making dies, molds and patterns dependent upon the plastic material to be processed or manufactured.
04.03 Demonstrate an understanding of processes and machines required to make a die, mold or pattern, i. e. milling, turning, drilling, boring, grinding, hobbing, casting, planing, etching, electroforming, electrical-discharge machining, plating, welding and shaping.
04.04 Design products which can be injection molded.
04.05 Design and construct molds for injection molding of product design above.
04.06 Design products which can be produced by extrusion.
04.07 Design and construct dies to produce various extrusion shapes.
04.08 Design product that can be blow molded.
04.09 Design and construct molds for products produced using the blow mold process.
04.10 Design products which are vacuum formed.
04.11 Design patterns and molds to produce products using the vacuum forming process.
04.12 Design products which are pressure formed.
04.13 Design and construct pressure forming molds.
04.14 Design products which are formed by slush, rotational or dip casting.
04.15 Design and construct molds to produce products utilizing slush, rotational and dip casting processes.
04.16 Design products which are compression model.
04.17 Design and construct molds which are used to produce products utilizing the compression molding process.
04.18 Design products which utilize contact, vacuum bag, pressure bag, autoclave, matched die, filament wound and spray processes.
04.19 Design and construct molds to produce products using contact, vacuum bag, pressure bag, autoclave, matched die, filament wound and spray molding processes.

05.0 MANUFACTURE COMPONENT PARTS--The student will be able to:

05.01 Demonstrate the ability to select and use molds, patterns, dies, raw materials, measuring and weighing devices, hand tools, fixed equipment, portable equipment and safe procedures to manufacture plastic component parts.
05.02 Manufacture finished plastic parts or products which utilize the following processes: injection molding, extrusion, bow molding, vacuum forming, pressure forming, slush forming, rotational forming, dip casting, compression molding, and contact, vacuum bag, pressure bag, autoclave, matched die, filament wound processes.

06.0 CONSTRUCT AND FINISH PLASTIC PRODUCTS--The student will be able to:

06.01 Demonstrate an understanding of processes, tools, materials and machines necessary to finish and assemble plastic products.
06.02 Demonstrate the ability to finish and assemble plastic products using the following processes: flash removal, slot cutting, polishing, annealing, sawing, filing, drilling, tapping, turning, planing, milling, shaping, routing, sanding, shearing, punching, laser cutting, tumbling, grinding, ashing, buffing, polishing, transparent coating, polishing by solvents, annealing, and post-curing.

07.0 REPAIR PLASTIC PRODUCTS--The student will be able to:

07.01 Demonstrate an understanding of types of repairs which can be performed on various types and classes of plastic products.
07.02 Demonstrate an understanding of types of products which can be used to perform successful repairs.

07.03 Demonstrate an understanding of appropriate tools, machines and processes which can be used to perform successful repairs on plastic products.
07.04 Demonstrate repairs to plastic products using the following processes: cohesive cementing, solvent cementing, mechanical fastening, stapling, snap fit, press fit, heat staking, ultrasonic staking, termal sealing, impulse sealing ultrasonic sealing, dielectric sealing, hot gas welding, spin welding, hot plate welding, ultrasonic welding, hot blade welding, high pressure lamination.

08.0 USE AND MAINTAIN HAND AND POWER TOOLS--The student will be able to:

08.01 Demonstrate an understanding of care and maintenance of hand tools.
08.02 Demonstrate the safe us of hand tools.
08.03 Demonstrate an understanding of care, adjustment and maintenance of fixed and portable power tools.
08.04 Demonstrate an understanding of care, adjustment, control, and maintenance of production machines.
08.05 Demonstrate the safe use of hand tools, power tools, and production machines to produce products or parts utilizing the processes identified in 05.0, 06.0, and 07.0 above.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Industrial Technology

CODE NUMBER: Secondary _______ Postsecondary ETI0600

Florida CIP IN15.060300

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-15

CERTIFICATION COVERAGE: IND ENGR 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as industrial engineering technicians (012.267-010), tool planners (012.167-074), quality control technicians (012.261-014), and test technicians (019.161-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, production and planning, design and installation of integrated systems and measurement, testing, and management of quality control in the manufacturing, transportation, assembly, installation, and operation of processes and products.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the operation of destructive and nondestructive testing equipment, measuring devices, specification reading, and design and measurement for levels of tolerance acceptable with overall specifications.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1620 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Prepare charts, graphs and diagrams.
02. Conduct time, motion, and cost control studies.
03. Determine estimates for tools, materials and supplies.
04. Sequence operations for fabrication and assembly of products.
05. Discuss manufacturing control procedures.
06. Read and interpret blueprints, schematics, and diagrams.

07. Demonstrate understanding of mechanics, hydraulics and schematics theory.
08. Demonstrate understanding of automated manufacturing processes.
09. Read, interpret, and write technical reports.
10. Demonstrate management skills.
11. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Industrial Technology POSTSECONDARY NUMBER: ETI0600

01.0 PREPARE CHARTS, GRAPHS, AND DIAGRAMS--The student will be able to:

01.01 Gather pertinent information for representation.
01.02 Utilize design tools to draw.
01.03 Evaluate information for description.
01.04 Free sketch draft of diagram.
01.05 Determine most effective means of representation.
01.06 Develop accurate information representation to scale.

02.0 CONDUCT TIME, MOTION, AND COST CONTROL STUDIES--The student will be able to:

02.01 Develop employee job requirements.
02.02 Analyze time spent on individual tasks.
02.03 Develop cost control data.
02.04 Evaluate production methods.
02.05 Generate specific job requirements.
02.06 Complete job status reports.

03.0 DETERMINE ESTIMATES FOR TOOLS, MATERIALS AND SUPPLIES--The student will be able to:

03.01 Analyze production tooling and materials needs.
03.02 Identify prospective suppliers.
03.03 Obtain bids for purchase.
03.04 Prepare and issue purchase requisition.
03.05 Receive and inspect materials.
03.06 Average distribution of materials based on need.

04.0 SEQUENCE OPERATIONS FOR FABRICATION AND ASSEMBLY OF PRODUCTS--The student will be able to:

04.01 Analyze product components.
04.02 Determine most effective production system.
04.03 Evaluate time requirements at each production step.
04.04 Determine tool, supply, and materials needs at each work station.
04.05 Lay out work procedures and stations.

05.0 DISCUSS MANUFACTURING CONTROL PROCEDURES--The student will be able to:

05.01 Evaluate motivation, production, quality and cost in planning efficiency.
05.02 Apply inspection processes in systems.
05.03 Implement quality control procedures.
05.04 Analyze workers and inspectors roles in quality production.
05.05 Plan trial run and production run.

06.0 READ AND INTERPRET BLUEPRINTS, SCHEMATICS, AND DIAGRAMS--The student will be able to:

06.01 Read detailer shop drawings.
06.02 Read assembly drawings.
06.03 Interpret sectional drawings.
06.04 Read and interpret dimensions by tolerance.
06.05 Identify symbols and abbreviations.

07.0 DEMONSTRATE UNDERSTANDING OF MECHANICS, HYDRAULICS AND SCHEMATICS THEORY--The student will be able to:

07.01 Demonstrate an understanding of measuring systems and ratios.
07.02 Locate the center of gravity of a mass.
07.03 Explain working forces of torque, tension, and compression.
07.04 Explain the laws of motion.
07.05 Explain how to calculate work.
07.06 Explain the function of simple machines including levers, inclined plane, wedge wheel and axle, pulley and screw.
07.07 Explain the types of power and the method of producing power including compound gears.
07.08 Calculate volume mathematically and by displacement.
07.09 Explain the laws of friction.
07.10 Identify common schematic symbols and diagrams.

07.11 Diagram an air supply system.
07.12 Install system components.
07.13 Explain system maintenance techniques.
07.14 Explain proper troubleshooting procedures.
07.15 Read a hydraulic schematic.
07.16 Identify hydraulic components.
07.17 Explain hydraulic system troubleshooting techniques.
07.18 Relate force, weight, mass and density to a pneumatic system.
07.19 Explain the operation of reciprocating compressors.
07.20 Explain the operation of positive-displacement rotary compressors.
07.21 Explain primary and secondary air treatment.
07.22 Explain the operation of valves, cylinders, and motors.

08.0 DEMONSTRATE UNDERSTANDING OF AUTOMATED MANUFACTURING PROCESSES--The student will be able to:

08.01 Analyze and evaluate transducers.
08.02 Analyze motor control systems.
08.03 Analyze synchros and resolvers.
08.04 Analyze pulse encoders.
08.05 Analyze farrand scales.

09.0 READ, INTERPRET, AND WRITE TECHNICAL REPORTS--The student will be able to:

09.01 Draw and interpret schematics.
09.02 Record data.
09.03 Write reports.
09.04 Maintain test logs.
09.05 Compose technical letters.

10.0 DEMONSTRATE MANAGEMENT SKILLS--The student will be able to:

10.01 Write and process production orders.
10.02 Select and care for materials.
10.03 Evaluate employee performance.
10.04 Prepare reports and technical data.
10.05 Perform production analysis.
10.06 Evaluate productivity of process.
10.07 Schedule production.
10.08 Perform station inspections.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Instrument Repair

CODE NUMBER: Secondary _______ Postsecondary EER0359

Florida CIP IN47.040100

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-17

CERTIFICATION COVERAGE: WATCH REPR @ 7 INSTRMENT 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as instrument repairers (710.261-010), electrical instrument repairers (729.281-026), calibrators (710.381-034), instrument technician helpers (710.684-030), inspectors (710.381-038), assemblers (710.681-010) and calibration lab technicians (019.281-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, maintenance and repair of meters, measuring devices, and control devices, dial pressure gauges, electrical controlling, measuring and recording devices, and optical, aeronautical and navigational instruments.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in AC and DC circuit operation, reading and interpretation of blueprints, schematics and diagrams and operation of electrical, thermal, pneumatic and hydraulic test instruments to repair and maintain meters, measuring and control devices.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0 , Language 8.0 . This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1600 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply DC circuit theory.
02. Apply AC circuit theory.
03. Identify the physical properties of state of matter.
04. Apply proper shop practices.
05. Identify safe work procedures.
06. Select and use hand tools.

07. Interpret blueprints, schematics and diagrams.
08. Maintain technical records and write technical reports.
09. Select and operate electronic test instruments.
10. Select and operate hydraulic test instruments.
11. Select and operate pneumatic test instruments.
12. Select and operate thermal test instruments.
13. Measure and maintain DC voltage.

STUDENT PERFORMANCE STANDARDS

INSTRUMENT REPAIR

01.0 APPLY DC CIRCUIT THEORY — The student will be able to:

01.01 Solve basic algebraic problems.
01.02 Relate electricity to nature of matter.
01.03 Identify sources of electricity.
01.04 Define voltage, current resistance, power and energy.
01.05 Apply Ohms law.
01.06 Read and interpret color codes to identify resistors.
01.07 Measure properties of a circuit using VOM and DVM meters.
01.08 Compute and measure conductance and resistance for conductors and insulators.
01.09 Analyze series circuits.
01.10 Construct series circuits.
01.11 Troubleshoot series circuits.
01.12 Analyze parallel circuits.
01.13 Construct parallel circuits.
01.14 Trouble shoot parallel circuits.
01.15 Analyze series - parallel circuits.
01.16 Construct series - parallel circuits.
01.17 Troubleshoot series - parallel circuits.
01.18 Analyze voltage dividers - loaded and unloaded.
01.19 Construct voltage dividers - loaded and unloaded.
01.20 Troubleshoot voltage dividers - loaded and unloaded.
01.21 Solve network theorem problems.
01.22 Analyze maximum power transfer theory.
01.23 Construct maximum power transfer theory.
01.24 Troubleshoot maximum power transfer theory.
01.25 Define magnetic propestus of circuits and devices.
01.26 Determine physical and electrical characteristics of capacitors and inductors.
01.27 Analyze and measure RL and RC time constants.
01.28 Set up and operate VOM for DC circuits.
01.29 Set up and operate DVM for DC circuits.
01.30 Set up and operate power supplies for DC circuits.
01.31 Set up and operate oscilloscopes for DC circuits.

02.0 APPLY AC CIRCUIT THEORY — The student will be able to:

02.01 Solve basic trigonometric problems.
02.02 Identify properties of an AC signal.
02.03 Identify AC sources.
02.04 Analyze and measure AC signals using oscilloscopes, frequency meters, and generators.
02.05 Analyze AC capacitive circuits.
02.06 Construct AC capacitive ciruits.
02.07 Troubleshoot AC capacitive circuits.
02.08 Analyze AC inductive circuits.
02.09 Construct AC inductive circuits.
02.10 Troubleshoot AC inductive circuits.
02.11 Analyze and apply principles of transformers to AC circuits.
02.12 Analyze RLC circuits.
02.13 Construct RLC circuits.
02.14 Troubleshoot RLC circuits.
02.15 Analyze series and parallel resonant circuits.
02.16 Construct series and parallel resonant circuits.
02.17 Troubleshoot series and parallel resonant circuits.
02.18 Analyze filter circuits.
02.19 Construct filter circuits.
02.20 Troubleshoot filter circuits.
02.21 Analyze polyphase circuits.
02.22 Construct polyphase circuits.
02.23 Troubleshoot polphase circuits.
02.24 Analyze basic motor theory and operation.
02.25 Analyze basic generator theory and operation.
02.26 Set up and operate VOM for AC circuits.
02.27 Set up and operate DVM for AC circuits.
02.28 Set up and operate power supplies for AC circuits.
02.29 Set up and operate oscilloscopes for AC circuits.
02.30 Set up and operate frequency counters for AC circuits.
02.31 Set up and operate signal generators for AC circuits.
02.32 Set up and operate capacitor - inductor analyzers for AC circuits.
02.33 Set up and operate impedance bridges for AC circuits.

03.0 IDENTIFY THE PHYSICAL PROPERITIES OF STATES OF MATTER - The student will be able to:

03.01 Identify the physical properities of gasses.
03.02 Identify the physical properities of liquids.
03.03 Identify the physical properities of solids.
03.04 Identify the nature of force.
03.05 Identify the physical properities of motion.
03.06 Identify the properties of work and energy.
03.07 Identify the principles of single machines.
03.08 Calculate area and volume.

04.0 APPLY PROPER SHOP PRACTICES — The student will be able to:

04.01 Apply safety standards.
04.02 Make electrical connections.
04.03 Handle static sensitive devices.
04.04 Identify and use fasteners.
04.05 Solder using solder techniques.
04.06 Set up and operate scales.
04.07 Set up and operate micrometers.
04.08 Set up and operate rules.
04.09 Set up and operate drill blocks.
04.10 Set up and operate dial indicators.
04.11 Set up and operate VERNIER scales.
04.12 Set up and operate mechanical and optical measuring devices.
04.13 Set up and operate height gauges.
04.14 Set up and operate depth gauges.
04.15. Read and convert measurements.
04.16 Perform preventative maintenance.

05.0 IDENTIFY SAFE WORK PROCEDURES — The student will be able to:

05.01 Identify plant safety procedures.
05.02 Observe safety precautions for tools and equipment.
05.03 Identify machinery safeguards.
05.04 Observe safety in handling materials.
05.06 Identify work area precautions.
05.07 Observe safety in handling hazardous material.
05.08 Observe electrical safety precautions.
05.09 Identify personal protection gear.

06.0 SELECT AND USE HAND TOOLS — The student will be able to:

06.01 Select and use power tools.
06.02 Select and use types of fasteners.
06.03 Select and use wrenches and screwdrivers.
06.04 Select and use pipefitting tools.
06.05 Select and use plumbing tools.
06.06 Select and use electrical tools.
06.07 Select and use sheet metal tools.
06.08 Select and use metal working tools.
06.09 Select and use hoisting and pulling tools.

07.0 INTERPRET BLUEPRINTS, SCHEMATICS — The student will be able to:

07.01 Identify basic principles of blueprint reading.
07.02 Identify elements of machine drawings.
07.03 Identify hydraulic and pneumatic drawings.
07.04 Read and interpret blueprints.
07.05 Read and interpret electrical drawings.
07.06 Read and interpret pipe system drawings.
07.07 Read and interpret sheet metal drawings.
07.08 Apply shop math to interpret blueprints.
07.09 Sketch schematic diagrams.
07.10 Identify types of schematic used in plant engineering.
07.11 Identify the symbols on electrical piping, fluid power and pneumatic diagrams.
07.12 Identify guidelines for reading schematics.
07.13 Identify electrical symbols.
07.14 Read and interpret electrical diagrams.

07.15 Identify piping symbols.
07.16 Read and interpret piping schematics.
07.17 Identify fluid power symbols.
07.18 Read and interpret fluid power schematics.
07.19 Identify welding symbols.
07.20 Draw electrical one-line diagrams from engineering sketches.
07.21 Draw electrical elementary diagrams from engineering sketches.
07.22 Draw electronic schematic diagrams from engineering sketches.
07.23 Prepare preliminary sketches.
07.24 Draw logic symbols.
07.25 Read and interpret I.S.A. symbols and identifications.
07.26 Read and interpret instrument loop drawings.
07.27 Read and interpret piping and instrument drawings.
07.28 Read and interpret logic drawings.
07.29 Read and interpret ladder diagrams.
07.30 Read and interpret pneumatic systems schematic.

08.0 MAINTAIN TECHNICIAN RECORDS AND WRITE TECHNICAL REPORTS — The student will be able to:

08.01 Record data and design curves and graphs.
08.02 Write reports.
08.03 Maintain test logs.
08.04 Prepare equipment failure reports.
08.05 Prepare purchase requistions.
08.06 Compose technical letters.
08.07 Write formal reports of laboratory experiments.
08.08 Record instrument calibrations.

09.0 SELECT AND OPERATE ELECTRONIC TEST INSTRUMENTS — The student will be able to:

09.01 Select and operate basic measuring instruments.
09.02 Select and operate VOLT-OHM Milliommeters (VOM).
09.03 Perform condition test on VOLT-OHM milliommeters (VOM).
09.04 Select and operate electronic voltmeters (EVM).
09.05 Perform condition test on electronic voltmeters (EVM).
09.06 Select and operate ohmmeters.
09.07 Select and operat oscilloscopes.
09.08 Perform condition test on oscilloscopes.
09.09 Select and operate tube testers.
09.10 Perform condition test on tube testers.
09.11 Select and operate transistor analyzers.
09.12 Perform condition test on transistor analyzers.
09.13 Select and operate capacitor testers.
09.14 Perform condition test on capacitor testes.
09.15 Select and operate sine wave generator.
09.16 Perform condition test on sine wave generators.
09.17 Select and operate signal generators.
09.18 Perform condition test on signal generators.
09.19 Select and operate pulse generators.
09.20 Perform condition test on pulse generator.
09.21 Select and operate square wave generators.
09.22 Perform condition test on square generators.
09.23 Select and operate impedance testers.
09.24 Select and operate frequency meters.
09.25 Perform condition test on frequency meters.
09.26 Select and operate decade boxes.
09.27 Perform condition test on resistor substitution boxes.
09.28 Select and operate wheatstone bridges.
09.29 Select and operate pH instruments.
09.30 Select and operate conductivity measuring instruments.
09.31 Select and operate millivolt sources.
09.32 Select and operate milliamp sources.

10.0 SELECT AND OPERATE HYDRAULIC TEST INSTRUMENTS — The student will be able to:

10.01 Select and operate basic hydraulic measuring instruments.
10.02 Select and operate dead weight testers.
10.03 Select and operate manometers.
10.04 Select and operate pressure gauges.

11.0 SELECT AND OPERATE PNEUMATIC TEST INSTRUMENTS — The student will be able to:

11.01 Select and operate basic pneumatic measuring instruments.
11.02 Select and operate pressure calibrators.
11.03 Select and operate vacuums pumps.
11.04 Select and operate dead weight testers.
11.05 Select and operate manometers.
11.06 Select and operate pressure and vacuum gauges.

12.0 SELECT AND OPERATE THERMAL TEST INSTRUMENTS — The student will be able to:

12.01 Select and operate basic thermal measuring instruments.
12.02 Select and operate heat baths.
12.03 Select and operate potentiometers.
12.04 Select and operate thermometers.

13.0 MEASURE AND MAINTAIN DC VOLTAGE — The student will be able to:

13.01 Determine meter movement, sensitivity and resistance.
13.02 Extend the current of a meter movement.
13.03 Extend the voltage range of a meter movement.
13.04 Perform condition test of semiconductor diodes using an ohmmeter.

14.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS — The student will be able to:

14.01 List sources of job opening other than public or private employment agencies.
14.02 Write a letter of application for a job.
14.03 Prepare a vita, resume or personal fact sheet.
14.04 List factors to consider when applying for a job.
14.05 List ways of making contact with employers.
14.06 Identify documents which may be required when applying for a job interview.
14.07 Complete a job application form correctly.
14.08 Identify appropriate dress and grooming for a job interview.
14.09 Classify behaviors considered appropriate or inappropriate in a job interview situation.
14.10 Describe advantage to employerr and employees of being a productive worker.
14.11 Explain the purpose of supervision, self discipline and performance evaluation.
14.12 Identify appropriate response(s) to criticism from employer, supervisor or other employees.
14.13 List consequences of being absent frequently from the job.
14.14 List consequences of frequently arriving late for work.
14.15 List factors to consider when resigning from a job.
14.16 Write a letter of resignation.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Instrumentation Technology

CODE NUMBER: Secondary ______ Postsecondary EET0200

Florida CIP IN15.040400

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-15

CERTIFICATION COVERAGE: TECH ELEC @ 7 ELECTRONIC 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as electrical engineers (10020800), instrumentation technicians (003.261-010), test technicians (019.161-014), instrument mechanics (710.381-042) and (710.281-026), instrument technicians (710.281-030) or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and technical training to support professional personnel in the design, development and evaluation of control and measurement devices, maintaining and repairing various types of meters, measuring devices, and control devices; dial pressure gauges; scales and balances; electrical controlling, measuring and recording devices; and optical, aeronautical and navigational instruments.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in electricity and electronic theory, practices and equipment, instrumentation, hydraulics, pneumatics, test apparatus and equipment, calibration and troubleshooting techniques.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 12.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply DC circuit theory.
02. Apply AC circuit theory.
03. Identify the physical properties of state of matter.
04. Apply proper shop practices.
05. Identify safe work procedures.

06. Select and use hand tools.
07. Interpret blueprints, schematics and diagrams.
08. Maintain technical records and write technical reports.
09. Select and operate electronic test instruments.
10. Select and operate hydraulic test instruments.
11. Select and operate pneumatic test instruments.
12. Select and operate thermal test instruments.
13. Measure and maintain DC voltage and low and high frequency.
14. Install electrical system components.
15. Identify, adjust and troubleshoot hydraulic and pneumatic systems.
16. Service electronic equipment.
17. Service instrument systems.
18. Service instruments in process loops.
19. Troubleshoot and service radiation measuring instruments.
20. Troubleshoot and service force measuring instruments.
21. Troubleshoot and service rate measuring instruments.
22. Troubleshoot and service quantity measuring instruments.
23. Troubleshoot and service physical property measuring instruments.
24. Troubleshoot and service chemical property measuring instruments.
25. Troubleshoot and service electrical measuring instruments.
26. Calibrate test instruments.
27. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS

INSTRUMENTATION TECHNOLOGY

01.0 APPLY DC CIRCUITY THEORY — The student will be able to:

01.01 Solve basic alegbraic problems as applicable to electronics.
01.02 Relate electricity to nature of matter.
01.03 Identify sources of electricity.
01.04 Define voltage, current, resistance, power, and energy.
01.05 Apply and relate Ohm's law.
01.06 Read and interpret color codes to identify resistors.
01.07 Measure properties of a circuit using VOM and DVM meters.
01.08 Compute and measure conductance and resistance of conductors and insulators.
01.09 Analyze series circuits.
01.10 Construct series circuits.
01.11 Troubleshoot series circuits.
01.12 Analyze parallel circuits.
01.13 Construct parallel circuits.
01.14 Troubleshoot parallel circuits.
01.15 Analyze series-parallel circuits.
01.16 Construct series-parallel circuits.
01.17 Troubleshoot series-parallel circuits.
01.18 Analyze voltage dividers (loaded and unloaded).
01.19 Construct voltage dividers (loaded and unloaded).
01.20 Troubleshoot voltage dividers (loaded and unloaded).
01.21 Solve network theorem problems.
01.22 Analyze maximum power transfer theory.
01.23 Construct maximum power transfer theory.
01.24 Troubleshoot maximum power transfer theory.
01.25 Define magnetic properties of circuits and devices.
01.26 Determine physical and electrical characteristics of capacitors and inductors.
01.27 Analyze and measure RL and RC time constants.
01.28 Set up and operate VOM for DC circuits.
01.29 Set up and operate DVM for DC circuits.
01.30 Set up and operate power supplies for DC circuits.
01.31 Set up and operate oscilloscopes for DC circuits.

02.0 APPLY AC CIRCUIT THEORY — The student will be able to:

02.01 Solve basic trigonometric problems as applicable to electronics.
02.02 Identify properties of an AC signal.
02.03 Identify AC sources.
02.04 Analyze and measure AC signals using oscilloscopes, frequency meters, and generators.
02.05 Analyze AC capacitive circuits.
02.06 Construct AC capacitive circuits.
02.07 Troubleshoot AC capacitive circuits.
02.08 Analyze AC inductive circuits.
02.09 Construct AC inductive circuits.
02.10 Troubleshoot AC inductive circuits.
02.11 Analyze and apply principles of transformers to AC circuits.
02.12 Analyze RLC circuits (series, parallel, complex).
02.13 Construct RLC circuits (series, parallel, complex).
02.14 Troubleshoot RLC circuits (series, parallel, complex).
02.15 Analyze series and parallel resonant circuits.
02.16 Construct series and parallel resonant circuits.
02.17 Troubleshoot series and parallel resonant circuits.
02.18 Analyze filter circuits.
02.19 Construct filter circuits.
02.20 Troubleshoot filter circuits.
02.21 Analyze polyphase circuits.
02.22 Construct polyphase circuits.
02.23 Troubleshoot polyphase circuits.
02.24 Analyze basic motor theory and operation.
02.25 Analyze basic generator theory and operation.
02.26 Set up and operate VOM for AC circuits.
02.27 Set up and operate DVM for AC circuits.
02.28 Set up and operate power supplies for AC circuits.
02.29 Set up and operate oscilloscopes for AC circuits.
02.30 Set up and operate frequency counters for AC circuits.
02.31 Set up and operate signal generators for AC circuits.
02.32 Set up and operate capacitor-inductor analyzers for AC circuits.
02.33 Set up and operate impedance bridges for AC circuits.

03.0 IDENTIFY THE PHYSICAL PROPERTIES OF STATES OF MATTER — The student will be able to:

03.01 Identify the physical properties of gases.
03.02 Identify the physical properties of liquids.
03.03 Identify the physical properties of of solids.
03.04 Identify the nature of force.
03.05 Identify the physical properties of motion.
03.06 Identify the principles of work and energy.
03.07 Identify the principles of simple machines.
03.08 Calculate areas and volume.

04.0 APPLY PROPER SHOP PRACTICES — The student will be able to:

04.01 Apply proper safety standards.
04.02 Make electrical connections.
04.03 Handle static sensitive devices.
04.04 Identify and use fasteners (screws, washers, pins, connectors).
04.05 Solder using proper soldering techniques.
04.06 Set up and operate scales.
04.07 Set up and operate micrometers.
04.08 Set up and operate rulers.
04.09 Set up and operate drill blocks.
04.10 Set up and operate dial indicators.
04.11 Set up and operate Vernier scales.
04.12 Set up and operate mechanical and optical measuring devices.
04.13 Set up and operate height gauges.
04.14 Set up and operate depth gauges.
04.15 Read and convert measurements.
04.16 Perform preventive maintenance according to vendor specifications.

05.0 IDENTIFY SAFE WORK PROCEDURES — The student will be able to:

05.01 Identify plant safety procedures.
05.02 Observe safety precautions for tools and equipment.
05.03 Identify machinery safeguards.
05.04 Observe safety in handling materials.
05.05 Identify work area safety precautions.
05.06 Identify fire prevention procedures.
05.07 Observe safety in handling hazardous materials.
05.08 Observe electrical safety precautions.
05.09 Identify personal protection gear.

06.0 SELECT AND USE HAND TOOLS — The student will be able to:

06.01 Select and use hand tools.
06.02 Select and use power tools.
06.03 Select types of fasteners.
06.04 Select and use wrenches and screwdrivers.
06.05 Select and use pipefitting tools.
06.06 Select plumbing tools.
06.07 Utilize plumbing tools.
06.08 Select and use sheet metal tools.
06.09 Select and use metal working tools.
06.10 Select and use hoisting and pulling tools.

07.0 INTERPRET BLUEPRINTS, SCHEMATICS AND DRAWINGS — The student will be able to:

07.01 Identify basic principles of blueprint reading.
07.02 Identify elements of machine drawings.
07.03 Identify hydraulic and pneumatic drawings.
07.04 Read and interpret blueprint drawings.
07.05 Read and interpret electrical drawings.
07.06 Read and interpret pipe system drawings.
07.07 Read and interpret sheet metal drawings.
07.08 Apply shop math to interpret blueprints.
07.09 Sketch schematic diagrams.
07.10 Identify types of schematics used in plant engineering.
07.11 Identify the symbols on electrical, piping, fluid power, and pneumatic diagrams.
07.12 Identify guidelines for reading schematics.
07.13 Identify electrical symbols.

07.14 Read and interpret electrical diagrams.
07.15 Identify piping symbols.
07.16 Read and interpret piping schematics.
07.17 Identify fluid power symbols.
07.18 Read and interpret fluid power schematics.
07.19 Identify welding symbols.
07.20 Draw electrical one-line diagrams from engineering sketches.
07.21 Draw electrical elementary diagrams from engineering sketches.
07.22 Draw electronic schematic diagrams from engineering sketches.
07.23 Prepare preliminary sketches.
07.24 Draw logic symbols.
07.25 Read and interpret Instrument Society of America (ISA) instrumentation symbols and identifications.
07.26 Read and interpret instrument loop drawings.
07.27 Read and interpret piping and instrument drawings.
07.28 Read and interpret logic diagrams.
07.29 Read and interpret ladder diagrams.
07.30 Read and interpret pneumatic systems schematics.

08.0 MAINTAIN TECHNICAL RECORDS AND WRITE TECHNICAL REPORTS — The student will be able to:

08.01 Draw and interpret electrical, electronic, and mechanical schematics.
08.02 Record data and design curves and graphs.
08.03 Write reports.
08.04 Maintain test logs.
08.05 Make equipment failure reports.
08.06 Specify and requisition simple electronic components.
08.07 Compose technical letters.
08.08 Write formal reports of laboratory experiments.
08.09 Record instrument calibration data.

09.0 SELECT AND OPERATE ELECTRONIC TEST INSTRUMENTS — The student will be able to:

09.01 Select and operate basic measuring instruments.
09.02 Select and operate volt-OHM milliammeters (VOM).
09.03 Perform condition test on volt-OHM milliammeters (VOM).
09.04 Select and operate electronic voltmeter (EVM).
09.05 Perform condition test on electronic voltmeter (EVM).
09.06 Select and operate Ohmeters.
09.07 Select and operate oscilloscopes.
09.08 Perform condition test on oscilloscopes.
09.09 Select and operate tube testers.
09.10 Perform condition test on tube testers.
09.11 Select and operate transistors analyzers.
09.12 Perform condition test on transistor analyzers.
09.13 Select and operate capacitor testers.
09.14 Perform condition test on capacitor testers.
09.15 Select and operate sine wave generators.
09.16 Perform condition test on sine wave generators.
09.17 Select and operate signal generators.
09.18 Select and operate pulse generators.
09.19 Perform condition test on pulse generators.
09.20 Select and operate square wave generators.
09.21 Perform condition test on square wave generators.
09.22 Select and operate impedance testers.
09.23 Select and operate frequency meters.
09.24 Perform condition test on frequency meters.
09.25 Operate test instruments to measure voltage, current and resistance.
09.26 Select and operate decade boxes.
09.27 Perform condition test on resistor substitution boxes.
09.28 Select and operate Wheatstone bridges.
09.29 Select and oerate ph instruments.
09.30 Select and operate conductivity measuring instruments.
09.31 Select and operate millivolt sources.
09.32 Select and operate milliamp sources.

10.0 SELECT AND OPERATE HYDRAULIC TEST INSTRUMENTS — The student will be able to:

10.01 Select and operate basic hydraulic measuring instruments.
10.02 Select and operate dead weight testers.

10.03 Select and operate manometers.
10.04 Select and operate pressure gauges.

11.0 SELECT AND OPERATE PNEUMATIC TEST INSTRUMENTS — The student will be able to:

11.01 Select and operate basic pneumatic measuring instruments.
11.02 Select and operate pressure calibrators.
11.03 Select and operate vacuum pumps.
11.04 Select and operate dead weight testers.
11.05 Select and operate manometer.
11.06 Select and operate pressure and vacuum gauges.

12.0 SELECT AND OPERATE THERMAL TEST INSTRUMENTS — The student will be able to:

12.01 Select and operate basic thermal measuring instruments.
12.02 Select and operate heat baths.
12.03 Select and operate potentiometers.
12.04 Select and operate thermometers.

13.0 MEASURE AND MAINTAIN DC VOLTAGE AND LOW AND HIGH FREQUENCY — The student will be able to:

13.01 Determine meter movement, sensitivity, and resistance.
13.02 Extend the current range of a meter movement.
13.03 Extend the voltage range of a meter movement.
13.04 Perform condition test of semiconductor diodes using Ohmeter.
13.05 Test amplifiers for amplification.
13.06 Determine vacuum tube amplifier failures.
13.07 Troubleshoot vacuum tube amplifiers.
13.08 Remove and replace vacuum tube amplifier components.
13.09 Perform operational systems checks and make minor adujustments to vacuum tube amplifiers.
13.10 Determine transistor amplifier failures.
13.11 Troubleshoot transistor amplifiers.
13.12 Remove and replace transistors amplifier components.
13.13 Perform operational systems checks and make minor adjustments to transistor amplifiers.
13.14 Identify component parts and electrical characteristics of power supply circuits.
13.15 Determine power supplies.
13.16 Troubleshoot power supplies.
13.17 Remove and replace power supply components.
13.18 Perform operational systems checks and make minor adjustments to power supplies.
13.19 Determine oscillator failures.
13.20 Troubleshoot oscillators.
13.21 Remove and replace oscillator components.
13.22 Perform operating systems checks and make minor adjustments to oscillators.
13.23 Determine clamper failures.
13.24 Troubleshoot clampers.
13.25 Remove and replace clamper components.
13.26 Perform operating systems checks and make minor adjustments to clampers.
13.27 Determine clipper failures.
13.28 Troubleshoot clipper circuits.
13.29 Remove and replace clipper circuit components.
13.30 Perform operating systems checks and make minor adjustments to clipper circuits.
13.31 Determine counter failures.
13.32 Troubleshoot counters.
13.33 Remove and replace counter components.
13.34 Perform operating sytems checks and make minor adjustments to counters.
13.35 Construct and perform condition tests of oscillators.
13.36 Construct and perform condition tests of pulse circuits.
13.37 Determine nonsinusoidal amplifier failures.
13.38 Troubleshoot nonsinusoidal amplifiers.
13.39 Remove and replace nonsinusoidal amplifier components.
13.40 Perform operating systems checks and make minor adjustments to nonsinusoidal amplifers.
13.41 Determine sweep-generator circuit failures.
13.42 Troubleshoot sweep-generator circuits.
13.43 Remove and replace sweep-generator circuits.
13.44 Perform operating systems checks and make minor adjustments to sweep-generator circuits.
13.45 Perform condition tests of zener Diddles used in regulator circuits.

14.0 INSTALL ELECTRICAL SYSTEM COMPONENTS — The student will be able to:

14.01 Identify the basic principles and terminology of process control systems.
14.02 Identify components of process control systems.
14.03 Create block diagrams of simple and complex loops.
14.04 Identify manual settings on process control systems.
14.05 Identify set point controllers on automatic process controls.
14.06 Identify on-off controllers on automatic process controls.
14.07 Identify proportional controllers on automatic process controls.
14.08 Identify proportional-integral controllers on automatic process controls
14.09 Identify proportional-integral-derivative controllers on automatic process controls.
14.10 Identify final control elements on automatic process controls.
14.11 Identify practical applications of power.
14.12 Identify electrical principles.
14.13 Identify electrical motors.
14.14 Read and interpret electrical schematic diagrams.
14.15 Install electrical system components.
14.16 Identify procedures for electrical system maintenance.
14.17 Determine electrical system failures.
14.18 Troubleshoot electrical systems using diagnostic techniques.
14.19 Remove and replace electrical system components.
14.20 Perform operating systems checks and make minor adjustments to electrical systems.
14.21 Identify system interfaces.

15.0 IDENTIFY, ADJUST, AND TROUBLESHOOT HYDRAULIC AND PNEUMATIC SYSTEMS — The student will be able to:

15.01 Identify practical applications of hydraulic power.
15.02 Identify hydraulic principles.
15.03 Identify control valves.
15.04 Identify pressure and safety relief valves and vacuum breakers.
15.05 Identify cylinders.
15.06 Identify motors.
15.07 Read and interpret hydraulic schematic drawings.
15.08 Install hydraulic system components.
15.09 Identify procedures for hydraulic system maintenance.
15.10 Determine hydraulic system failures.
15.11 Troubleshoot hydraulic system using diagnostic techniques.
15.12 Remove and replace hydraulic system.
15.13 Perform operating systems checks and make minor adjustment to hydraulic systems.
15.14 Identify strainers and filters in hydraulic systems.
15.15 Identify reservoirs and accumulators in hydraulic systems.
15.16 Identify hydraulic pumps on a system.
15.17 Identify piping, tubing, and fittings on a hydraulic system.
15.18 Identify directional control valves in hydraulic systems.
15.19 Identify hydraulic fluids.
15.20 Identify hydraulic system interfaces.
15.21 Identify practical applications of pneumatic power.
15.22 Identify pneumatic principles.
15.23 Identify reciprocating compressors.
15.24 Identify rotary compressors.
15.25 Identify primary air treatment in pneumatic systems.
15.26 Identify secondary air treatment methods.
15.27 Identify piping, hoses, and fittings used in pneumatic systems.
15.28 Identify relief and safety valves and vacuum breakers used in pneumatic systems.
15.29 Identify control valves used in pneumatic systems.
15.30 Identify cylinders used in pneumatic systems.
15.31 Identify motors used in pneumatic systems.
15.32 Identify components of pneumatic systems.
15.33 Read and interpret schematic diagrams.
15.34 Identify the procedures for pneumatic system maintenance.
15.35 Determine pneumatic system failures.
15.36 Troubleshoot pneumatic systems.
15.37 Remove and replace pneumatic system components.
15.38 Perform operating systems checks and make minor adjustments to pneumatic systems.
15.39 Determine air compressor failures.
15.40 Troubleshoot air compressor.
15.41 Remove and replace air compressor components.
15.42 Perform operating systems checks and make minor adjustments to air compressor.
15.43 Determine control valve failures.

15.44 Troubleshoot control valves.
15.45 Remove and replace control valve components.
15.46 Perform operating systems checks and make minor adjustment to control valves.
15.47 Determine cylinder failures.
15.48 Troubleshoot cylinders.
15.49 Remove and replace cylinder components.
15.50 Perform operating systems checks and make minor adjustments to cylinders.
15.51 Determine air motor failures.
15.52 Troubleshoot air motors.
15.53 Remove and replace air motor components.
15.54 Perform operating systems checks and make minor adjustments to air motors.
15.55 Identify strainers and filters in pneumatic systems.
15.56 Identify reservoirs in pneumatic systems.
15.57 Identify pneumatic pumps on systems.
15.58 Identify directional control valves on pneumatic systems.
15.59 Identify pneumatic system interfaces.

16.0 SERVICE ELECTRONIC EQUIPMENT — The student will be able to:

16.01 Perform visual inspection on electronic equipment.
16.02 Clean electronic equipment.
16.03 Lubricate electronic equipment.
16.04 Inspect and replace power cords and distribution cables.
16.05 Inspect and replace resistors.
16.06 Inspect and replace capacitors.
16.07 Inspect and replace inductors.
16.08 Inspect and replace vacuum tubes.
16.09 Inspect and replace transistors.
16.10 Inspect and replace IC units.
16.11 Inspect and replace printed circuit (PC) boards.
16.12 Perform a proof of performance check on electronic equipment.
16.13 Keep records on maintenance of equipment.

17.0 SERVICE INSTRUMENT SYSTEMS — The student will be able to:

17.01 Identify automatic control systems functions.
17.02 Identify the elements of process control.
17.03 Identify system transmitters and receivers.
17.04 Identify diagram symbols and networks.
17.05 Identify parameters of an operational process contol system.
17.06 Identify measurement purpose and requirements.
17.07 Identify the elements of measurement systems.
17.08 Identify measured transducers.
17.09 Identify instrument calibration standard units.
17.10 Analyze systems using troubleshooting flow sheet.
17.11 Identify pressure principles.
17.12 Identify pressure sensors.
17.13 Identify pressure transducers.
17.14 Identify low pressure measurement gauges requirements.
17.15 Install and service pressure instruments.
17.16 Identify force, stress, and strain measurement units.
17.17 Identify weight and mass measuring instruments.
17.18 Identify methods for weighing materials in motion.
17.19 Identify displacement measurement methods.
17.20 Identify acceleration vibration, and shock measurement methods.
17.21 Identify the properties of fluid flow measurement.
17.22 Identify primary measuring devices for fluid flow.
17.23 Identify secondary measuring devices for fluid flow.
17.24 Identify applications for variable area instruments.
17.25 Identify open channel flow devices.
17.26 Identify applications for positive displaement meters.
17.27 Identify applications for turbine flow meters
17.28 Identify applications magnetic flow meters.
17.29 Identify applications for ultrasonic flow metering methods.
17.30 Identify solid particles flow metering methods.
17.31 Install and maintain flow instruments.
17.32 Identify level measurement instruments.
17.33 Identify pressure head instruments.
17.34 Identify electrical methods for level measurement.
17.35 Identify solid level measuring systems.

17.36 Service level measuring instruments.
17.37 Identify temperature measuring principles and sensors.
17.38 Identify bimetallica and fluid-filled temperature measuring instrument.
17.39 Identify instruments using electrical methods of measuring temperature.
17.40 Identify pyrometers.
17.41 Perform temperature measuring instrument maintenance.
17.42 Identify final control elements in process loops.
17.43 Identify electric actuators.
17.44 Identify pneumatic and hydraulic actuators.
17.45 Identify control valves.
17.46 Identify control element applications.
17.47 Identify on-site safety standards and maintenance practices.
17.48 Identify servicing requirements.
17.49 Detail electrical and electronic servicing stations.
17.50 Detail pneumatic and hydraulic servicing stations.
17.51 Detail troubleshooting requirements.
17.52 Identify applications of vacuum measuring methods.

18.0 TROUBLESHOOT AND SERVICE THERMAL MEASURING — The student will be able to:

18.01 Determine temperature measuring instrument and sensor failures.
18.02 Troubleshoot temperature measuring instruments and sensors.
18.03 Remove and replace temperature measuring instrument and sensor components.
18.04 Perform operating systems checks and make adjustments to temperature measuring instruments and sensors.
18.05 Determine calorific value measuring instrument failures.
18.06 Troubleshoot calorific value measuring instrument.
18.07 Remove and replace calorific value measuring instrument components.
18.08 Perform operating systems checks and make minor adjustments to calorific value measuring instruments.

19.0 TROUBLESHOOT AND SERVICE RADIATION MEASURING INSTRUMENTS — The student will be able to:

19.01 Determine radiation measuring instrument failures.
19.02 Troubleshoot radiation measuring instruments.
19.03 Remove and replace radiation measuring instrument components.
19.04 Perform operating systems checks and make minor adjustments to radiation measuring instruments.
19.05 Determine photometric measuring instrument failures.
19.06 Troubleshoot photometric measuring instruments.
19.07 Remove and replace photometric measuring instrument components.
19.08 Perform operating systems checks and make minor adjustments to photometric measuring instruments.
19.09 Determine acoustic measuring instrument failures.
19.10 Troubleshoot acoustic measuring instruments.
19.11 Remove and replace acoustic measuring instrument components.
19.12 Perform operating systems checks and make minor adjustments to acoustic measuring instruments.

20.0 TROUBLESHOOT AND SERVICE FORCE MEASURING INSTRUMENTS — The student will be able to:

20.01 Identify force measuring instruments.
20.02 Determine moment (torque) measuring instrument failures.
20.03 Troubleshoot moment (torque) measuring instruments.
20.04 Remove and replace moment (torque) measuring instrument components.
20.05 Perform operating systems checks and make adjustments to moment (torque) measuring instruments.
20.06 Determine force per unit area measuring instrument failures.
20.07 Troubleshoot force per unit area measuring instruments.
20.08 Remove and replace force per unit area measuring instrument components.
20.09 Perform operating systems checks and make adjustments to force per unit area measuring instruments.

21.0 TROUBLESHOOT AND SERVICE RATE MEASURING INSTRUMENTS — The student will be able to:

21.01 Determine flow measuring instrument failures.
21.02 Troubleshoot flow measuring instrument failures.
21.03 Remove and replace flow measuring instrument components.
21.04 Perform operating systems checks and make minor adjustments to flow measuring instruments.
21.05 Determine speed measuring instrument failures.

21.06 Troubleshoot speed measuring instruments.
21.07 Remove and replace speed measuring instrument components.
21.08 Perform operating systems checks and make minor adjustments to speed measuring instruments.
21.09 Determine velocity measuring instrument failures.
21.10 Troubleshoot velocity measuring instruments.
21.11 Remove and replace velocity measuring instrument components.
21.12 Perform operating systems checks and make minor adjustments to velocity measuring instruments.
21.13 Determine acceleration measuring instrument failures.
21.14 Troubleshoot acceleration measuring instruments.
21.15 Remove and replace acceleration measuring instrument components.
21.16 Perform operating systems checks and make minor adjustments to acceleration measuring instruments.

22.0 TROUBLESHOOT AND SERVICE QUANTITY MEASURING INSTRUMENTS — The student will be able to:

22.01 Determine mass measuring instrument failures.
22.02 Troubleshoot mass measuring instrument failures.
22.03 Remove and replace mass measuring instrument components.
22.04 Perform operating systems checks and make minor adjustments to mass measuring instruments.
22.05 Determine weight measuring instrument failures.
22.06 Troubleshoot weight measuring instruments.
22.07 Remove and replace weight measuring instrument components.
22.08 Perform operating systems checks and make minor adjustments to weight measuring instruments.

23.0 TROUBLESHOOT AND SERVICE PHYSICAL PROPERTY MEASURING INSTRUMENTS — The student will be able to:

23.01 Determine density and specific gravity measuring instruments failures.
23.02 Troubleshoot density and specific gravity measuring instruments.
23.03 Remove and replce density and specific gravity measuring instrument components.
23.04 Perform operating systems checks and make adjustments to density and specific gravity measuring instruments.
23.05 Determine humidity measuring instrument failures.
23.06 Troubleshoot humidity measuring instruments.
23.07 Remove and replace humidity measuring instrument components.
23.08 Perform operating systems checks and make minor adjustments to humidity measuring instruments.
23.09 Determine moisture content measuring instrument failures.
23.10 Troubleshoot moisture content measuring instruments.
23.11 Remove and replace moisture content measuring instrument components.
23.12 Perform operating systems checks and make minor adjustments to moisture content measuring instruments.
23.13 Determine viscosity measuring instrument failures.
23.14 Troubleshoot viscosity measuring instruments.
23.15 Remove and replace viscosity measuring instrument components.
23.16 Perform operating systems checks and make minor adjustments to viscosity measuring instruments.
23.17 Determine consistency measuring instrument failures.
23.18 Troubleshoot consistency measuring instruments.
23.19 Remove and replace consistency measuring instrument components.
23.20 Perform operating systems check and make minor adjustments to consistency measuring instruments.
23.21 Determine structural characteristics measuring instrument failure.
23.22 Troubleshoot structural characteristic measuring instruments.
23.23 Remove and replace structural characteristic measuring instrument components.
23.24 Perform operating systems checks and make adjustments to structural characteristic measuring instruments.

24.0 TROUBLESHOOT AND SERVICE CHEMICAL PROPERTY MEASURING INSTRUMENTS — The student will be able to:

24.01 Determine analytical measuring instrument failures.
24.02 Troubleshoot analytical measuring instruments.
24.03 Remove and replace analytical measuring instrument components.
24.04 Perform operating systems checks and makie minor adjustments to analytical measuring instruments.

24.05 Determine pH measuring instrument failures.
24.06 Troubleshoot pH measuring instruments.
24.07 Remove and replace pH measuring instrument components.
24.08 Perform operating systems checks and make minor adjustments to pH measuring instruments.
24.09 Determine liquid conductivity measuring instrument failures.
24.10 Troubleshoot liquid conductivity measuring instruments.
24.11 Remove and replace liquid conductivity measuring instrument components.
24.12 Perform operating systems checks and make adjustments to liquid conductivity measuring instruments.
24.13 Determine chromatograph measuring instrument failures.
24.14 Troubleshoot chromatograph measuring instruments.
24.15 Remove and replace chromatogaph measuring instrument components.
24.16 Perform operating systems checks and make minor adjustments to chromatograph measuring instruments.
24.17 Determine mass spectrometer measuring instrument failures.
24.18 Troubleshoot mass spectrometer measuring instruments.
24.19 Remove and replace mass spectrometer measuring instrument components.
24.20 Perform operating systems checks and make adjustments to mass spectrometer measuring instruments.
24.21 Determine gas analyzer measuring instrument failures.
24.22 Troubleshoot gas analyzer measuring instruments.
24.23 Remove and replace gas analyzer measuring instruments.
24.24 Perform operating systems checks and make minor adjustments to ga analyzer measuring instruments.

25.0 TROUBLESHOOT AND SERVICE ELECTRICAL MEASURING INSTRUMENTS — The student will be able to:

25.01 Determine electromotive force measuring instrument failures.
25.02 Troubleshoot electromotive force measuring instruments.
25.03 Remove and replace electromotive force measuring instrument components.
25.04 Perform operating systems checks and make adjustments to electromotive force measuring instruments.
25.05 Determine electric current measuring instrument failures.
25.06 Troubleshoot electric current measuring instruments.
25.07 Remove and replace electric current measuring instrument components.
25.08 Perform operating systems checks and make adjustments to electric current measuring instruments.
25.09 Determine resistance measuring instrument failures.
25.10 Troubleshoot resistance measuring instruments.
25.11 Remove and replace resistance measuring instrument components.
25.12 Perform operating systems checks and make minor adjustments to resistance measuring instruments.
25.13 Determine conductance measuring instrument failures.
25.14 Troubleshoot conductance measuring instruments.
25.15 Remove and replace conductance measuring instrument components.
25.16 Perform operating systems checks and make minor adjustments to conductance measuring instruments.
25.17 Determine inductance measuring instrument failures.
25.18 Troubleshoot inductance measuring instruments.
25.19 Remove and replace inductance measuring instruments components.
25.20 Perform operating systems checks and make minor adjustments to inductance measuring instruments.
25.21 Determine capacitance measuring instrument failures.
25.22 Troubleshoot capacitance measuring instruments.
25.23 Remove and replace capacitance measuring instrument components.
25.24 Perform operating systems checks and make minor adjustments to capacitive measure instruments.
25.25 Determine impedance measuring instrument failures.
25.26 Troubleshoot impedance measuring instruments.
25.27 Remove and replace impedance measuring instrument components.
25.28 Perform operating systems checks and make minor adjustments to impedance measuring instruments.

26.0 CALIBRATE TEST INSTRUMENTS — The student will be able to:

26.01 Calibrate volt-OHM milliammeters (VOM).
26.02 Calibrate electronic voltmeters (EVM).
26.03 Calibrate tube testers.
26.04 Calibrate transistor testers.

26.05 Calibrate resistor substitution boxes.
26.06 Calbirate oscilloscopes.
26.07 Calibrate sine wave generators.
26.08 Calibrate square wave and pulse generators.
26.09 Calibrate frequency meters.
26.10 Calibrate power supply voltage.

27.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS — The student will be able to:

27.01 List sources of job opening other than public or private employment agencies.
27.02 Write a letter of application for a job.
27.03 Prepare a vita, resume or personal fact sheet.
27.04 List factors to consider when applying for a job.
27.05 List ways of making contact with employers.
27.06 Identify documents which may be required when applying for a job interview.
27.07 Complete a job application form correctly.
27.08 Identify appropriate dress and grooming for a job interview.
27.09 Classify behaviors considered appropriate or inappropriate in a job interview situation.
27.10 Describe advantage to employerr and employees of being a productive worker.
27.11 Explain the purpose of supervision, self discipline and performance evaluation.
27.12 Identify appropriate response(s) to criticism from employer, supervisor or other employees.
27.13 List consequences of being absent frequently from the job.
27.14 List consequences of frequently arriving late for work.
27.15 List factors to consider when resigning from a job.
27.16 Write a letter of resignation.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Insulation Installation

CODE NUMBER: Secondary _______ Postsecondary BCT0180

Florida CIP IN46.040700

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-17

CERTIFICATION COVERAGE: TEC CONSTR @ 7 BLDG CONST @ 7 INSULAT 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as asbestos and insulation workers (61080200), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, use of personal protection equipment, ladders and scaffolds, and the fabrication and installation of insulating materials.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in erection of scaffolds and ladders, occupational health concerns and use of personal protection equipment, and installation of insulating materials in new and existing structures.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 450 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of general applications and uses of insulation.
02. Apply insulation theory to job needs.
03. Explain and demonstrate appropriate field safety rules and procedures.
04. Read and interpret blueprints and specifications.
05. Describe the application and apply various insulation materials.
06. Demonstrate the use of accessory materials for insulation.
07. Perform specialized insulation activities.
08. Perform measurement of materials for job site.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education
SECONDARY NUMBER: ________
PROGRAM TITLE: Insulation Installation
POSTSECONDARY NUMBER: BCT0180

01.0 DEMONSTRATE KNOWLEDGE OF GENERAL APPLICATIONS AND USES OF INSULATION--The student will be able to:

01.01 Describe uses of insulation.
01.02 Identify insulation bonding agents such as tapes and cements.
01.03 Describe insulation needs of mechanical systems on buildings such as heating and air conditioning units.
01.04 Describe insulation needs of plumbing and pipes.

02.0 APPLY INSULATION THEORY TO JOB NEEDS--The student will be able to:

02.01 State the concept of heat transfer.
02.02 Describe methods of heat transfer.
02.03 Identify factors of insulation.
02.04 Analyze moisture effects on insulation material.
02.05 State the cause of vapor.
02.06 Identify different vapor barriers.

03.0 EXPLAIN AND DEMONSTRATE APPROPRIATE FIELD SAFETY RULES AND PROCEDURES--The student will be able to:

03.01 Utilize appropriate protective clothing.
03.02 Apply first-aid procedures as needed.
03.03 Set-up warning signs, signals, and barricades,
03.04 Operate tools safety.
03.05 Place ladders and scaffolding appropriately.
03.06 Store materials safely and securely.

04.0 READ AND INTERPRET BLUEPRINTS AND SPECIFICATIONS--The student will be able to:

04.01 Read and interpret job specifications.
04.02 Analyze plot plan.
04.03 Verify plan view.
04.04 Determine proper elevation section.
04.05 Read and interpret isometric drawing.
04.06 Interpret blueprint based on various scale.
04.07 Identify column lines.
04.08 Define blueprint symbols.

05.0 DESCRIBE THE APPLICATION AND APPLY VARIOUS INSULATION MATERIALS--The student will be able to:

05.01 Describe the uses of fiberglass.
05.02 Describe the uses of mineral wool.
05.03 Describe the uses of cellular glass.
05.04 Describe the uses of polyurethane (rigid).
05.05 Describe the uses of polystrene (expanded and extended).
05.06 Describe the uses of cablular foam (flexible).
05.07 Describe the uses of calcuim silicate.
05.08 Describe the uses of expanded perlite.
05.09 Describe the uses of ceramic fibers.
05.10 Install pipe coverings.
05.11 Install wall insulations.
05.12 Install insulation to mechanical systems such as block boilers, tanks, flues, and environmental units.
05.13 Describe multi-layer applications.
05.14 Install board and block materials.
05.15 Apply blanket dust wrap.
05.16 Apply sprayed, formed, and foam insulations.
05.17 Cut materials using appropriate tools.

06.0 DEMONSTRATE THE USE OF ACCESSORY MATERIALS FOR INSULATION--The student will be able to:

06.01 Apply various adhesives.
06.02 Utilize cement bondings as needed.
06.03 Install fasteners and clips.
06.04 Apply reinforcement materials.

06.05 Install mastics for vapor proofing as needed.
06.06 Utilize pipe jackets.
06.07 Describe function and use of weather barriers.

07.0 PERFORM SPECIALIZED INSULATION ACTIVITIES--The student will be able to:

07.01 Apply and describe uses of insulated panels.
07.02 Describe the uses of crygenic insulation.
07.03 Identify and install fire protection.
07.04 Describe the uses of acoustical insulations.
07.05 Describe the uses of temperature refractory insulation.

08.0 PERFORM MEASUREMENT OF MATERIALS FOR JOB SITE--The student will be able to:

08.01 Estimate amount of materials needed.
08.02 Order appropriate insulations for job site.
08.03 Calculate exact measurements for insulation.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Jewelry Manufacturing and Repair

CODE NUMBER: Secondary ______ Postsecondary MTR0020

Florida CIP IN48.060200

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-17

CERTIFICATION COVERAGE: METAL WORK @ 7 JWLY MFGR 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as jewelers (700.281-010), solderers (704.381-050), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, fabrication and repair of jewelry articles as rings, brooches, pendants, bracelets, and lockets, form models and molds, set stones, cast jewelry, cut, file, and polish articles using hand tools and polishing wheels, and reshape and restyle old jewelry.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in all phases of jewelry manufacturing and repair including design, construction, and molding jewelry articles.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1300 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Develop basic trade skills.
02. Roll metal and wire.
03. Perform sawing, piercing and cutting skills.
04. Solder jewelry.
05. Design and fabricate jewelry.
06. Cast jewelry.
07. Set stones.

08. Repair jewelry.
09. Apply surface treatment.
10. Finish jewelry.
11. Perform basic shop management skills.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ______

PROGRAM TITLE: Jewelry Manufacturing and Repair POSTSECONDARY NUMBER: MTR0020

01.0 DEVELOP BASIC TRADE SKILLS--The student will be able to:

01.01 Identify safety skills.
01.02 Develop basic math, measuring and weighing skills.
01.03 Test and identify metals.
01.04 Test and identify stones.
01.05 Select and use hand tools and equipment.

02.0 ROLL METAL AND WIRE--The student will be able to:

02.01 Melt precious metals into ingots.
02.02 Roll ingot into sheet metal/wire.
02.03 Construct a tubing wire.

03.0 PERFORM SAWING, PIERCING, FILING AND CUTTING SKILLS--The student will be able to:

03.01 Use sawing techniques.
03.02 Use piercing techniques.
03.03 Use filing techniques.
03.04 Use cutting techniques.

04.0 SOLDER JEWELRY--The student will be able to:

04.01 Select torch equipment and hand tools.
04.02 Select appropriate solder and flux.
04.03 Solder jewelry.

05.0 DESIGN AND FABRICATE JEWELRY--The student will be able to:

05.01 Design and fabricate jewelry using wire.
05.02 Design and fabricate jewelry using jewelry metals.
05.03 Design and fabricate jewelry using surface treatments.

06.0 CAST JEWELRY--The student will be able to:

06.01 Identify types of casting methods.
06.02 Design and sculpture wax models and molds.
06.03 Cast jewelry pieces using lost wax process.

07.0 SET STONES--The student will be able to:

07.01 Set stone in a pronged mounting.
07.02 Set stone in a bezel setting.
07.03 Set stone in a baguette setting.
07.04 Set stone in a pave setting.
07.05 Set stone in a peg setting.
07.06 Set stone in a tube setting.
07.07 Set stone in a channel setting.

08.0 REPAIR JEWELRY--The student will be able to:

08.01 Repair chain.
08.02 Size ring.
08.03 Reshank ring.
08.04 Repair or replace findings.
08.05 Repair prong.
08.06 Repair hinge.

09.0 APPLY SURFACE TREATMENT--The student will be able to:

09.01 Identify surface techniques.
09.02 Electroplate jewelry.
09.03 Etch jewelry.
09.04 Enamel metal.
09.05 Apply repousse' and chasing techniques.
09.06 Apply engraving techniques.

10.0 FINISH JEWELRY--The student will be able to:

10.01 Buff jewelry using abrasives.

- 10.02 Polish jewelry.
- 10.03 Clean jewelry.

11.0 PERFORM BASIC SHOP MANAGEMENT SKILLS--The student will be able to:

- 11.01 Apply customer relations skill.
- 11.02 Prepare cost estimates and work orders.
- 11.03 Maintain a shop production schedule.
- 11.04 Maintain inventory.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

- 12.01 Conduct a job search.
- 12.02 Secure information about a job.
- 12.03 Identify documents which may be required when applying for a job interview.
- 12.04 Complete a job application form correctly.
- 12.05 Demonstrate competence in job interview techniques.
- 12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
- 12.07 Identify acceptable work habits.
- 12.08 Demonstrate knowledge of how to make job changes appropriately.
- 12.09 Demonstrate acceptable employee health habits.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

- 13.01 Define entrepreneurship.
- 13.02 Describe the importance of entrepreneurship to the American economy.
- 13.03 List the advantages and disadvantages of business ownership.
- 13.04 Identify the risks involved in ownership of a business.
- 13.05 Identify the necessary personal characteristics of a successful entrepreneur.
- 13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Laser Electro-Optic Technology

CODE NUMBER: Secondary ______ Postsecondary EST0230

Florida CIP IN15.030400

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-15

CERTIFICATION COVERAGE: TEC ELEC @ 7 ELECTRONIC 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as electrical and electronic technicians (10080803), laser technicians (019.181-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The program prepares students to assist engineers and scientists in assembly, installation, repair, adjustment, and operation of various types of lasers.

The content includes, but is not limited to, communication skills; leadership skills; human relations and employability skills; safe and efficient work practices; identification, use and maintenance of lasers and laser systems; use of optical elements; performance of laser technology applications; calibration, troubleshooting and analyzing laser peripheral components; and demonstration of laser energy applications.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in laser safety, optical cleaning, applicable laser test equipment, optical systems, laser technology, laser peripheral components, applicable laser applications, laser projects, and laser optics measurements.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

Students admitted to the program must not be color blind and should have a math background in algebra and trigonometry.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 10.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 2400 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in DC electronics.
02. Demonstrate proficiency in AC electronics.

03. Demonstrate proficiency in semiconductor devices and circuits.
04. Demonstrate proficiency in electronic circuits.
05. Demonstrate proficient soldering and chassis assembly techniques.
06. Demonstrate communications skills including technical recording and reporting, leadership skills, and human relations skills.
07. Demonstrate proficiency in analysis methodology.
08. Demonstrate proficiency in digital circuits and devices.
09. Demonstrate proficiency in microprocessors.
10. Identify, use and maintain lasers and laser systems.
11. Demonstrate and practice the uses of optical elements.
12. Demonstrate and analyze wave optical systems.
13. Perform laser technology applications.
14. Calibrate, troubleshoot and analyze laser peripheral components.
15. Demonstrate and practice laser energy applications.
16. Analyze, construct and demonstrate laser optical measurements.
17. Demonstrate employability skills.
18. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial SECONDARY NUMBER: ________

PROGRAM TITLE: Laser Electro-Optic Technology POSTSECONDARY NUMBER: EST0230

01.0 DEMONSTRATE PROFICIENCY IN DC ELECTRONICS THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF TOOLS AND TEST EQUIPMENT, AND TROUBLESHOOTING PROCEDURES--The student will be able to:

01.01 Solve electronic math problems related to DC circuits including series, parallel, and series-parallel circuits.

01.02 Identify and define electron theory and sources of electrical energy.

01.03 Define the relationship between current, voltage, resistance and power.

01.04 Solve basic electronic problems involving current, voltage, resistance and power.

01.05 Identify and measure resistors.

01.06 Use an analog and digital multimeter to measure current, voltage, resistance, and continuity of passive components.

01.07 Draw, analyze, construct and troubleshoot series circuits.

01.08 Draw, analyze, construct and troubleshoot parallel circuits.

01.09 Draw, analyze, construct and troubleshoot series-parallel circuits.

01.10 Draw, analyze, construct and troubleshoot voltage divider circuits.

01.11 Demonstrate a knowledge of magnetism and electromagnetism.

01.12 Analyze and calculate RL and RC time constants.

01.13 Set up and operate power supplies for DC circuits.

01.14 Set up and operate oscilloscopes for DC circuits.

01.15 Troubleshoot and locate defective components in a functional DC circuit consisting of resistors, relays, lamps, switches, fuses, inductors, rheostats, potentiometers, capacitors, conductors, and power supplies.

02.0 DEMONSTRATE PROFICIENCY IN AC ELECTRONICS THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF APPROPRIATE TOOLS AND TEST EQUIPMENT, AND TROUBLESHOOTING PROCEDURES--The student will be able to:

02.01 Solve electronics math problems related to AC circuits including: RC, RL, RLC, LC, and Z for series, parallel and series-parallel circuits.

02.02 Identify properties of an AC sineusoidol waveform.

02.03 Use an analog and digital multimeter to measure current, voltage, resistance, and continuity of passive components.

02.04 Draw, analyze, construct, and troubleshoot AC resistive circuits.

02.05 Draw, analyze, construct, and troubleshoot series, parallel, and series-parallel capacitive and resistive-capacitive circuits.

02.06 Draw, analyze, construct, and troubleshoot series, parallel, and series-parallel inductive and resistive-inductive circuits.

02.07 Draw, analyze, construct, and troubleshoot series, parallel, and capacitive-inductive circuits.

02.08 Draw, analyze, construct, and troubleshoot transformer circuits.

02.09 Draw, analyze, construct, and troubleshoot series, parallel, and series-parallel resistive-capacitive-inductive circuits.

02.10 Draw, analyze, construct, and troubleshoot series and parallel resonant circuits.

02.11 Draw, analyze, construct, and troubleshoot low-pass, high-pass, bandpass, and reject active filters.

02.12 Analyze basic motor and generator theory and operation.

02.13 Set up and operate power supplies for AC circuits.

02.14 Set up and operate oscilloscopes for AC circuits.

02.15 Set up and operate frequency counters for AC circuits.

02.16 Set up and operate signal generators for AC circuits.

02.17 Troubleshoot and locate defective components in a functional AC circuit consisting of resistors, capacitors, inductors, and transformers.

03.0 DEMONSTRATE PROFICIENCY IN SEMICONDUCTOR DEVICES THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF TOOLS AND TEST EQUIPMENT--The student will be able to:

03.01 Identify properties of semiconductor material.

03.02 Analyze and measure characteristics of P-N diodes.

03.03 Analyze and measure characteristics of special diodes, including: tunnel rectifier, zener, varactor.
03.04 Analyze and measure characteristics of Bipolar Junction Transistors (BJT).
03.05 Analyze and measure characteristics of Field Effect Transistor (FET).
03.06 Analyze and measure characteristics of Metal Oxide Semiconductor Field Effect Transistor (MOSFET).
03.07 Analyze and measure characteristics of Thyristors.
03.08 Analyze and measure characteristics of Optoelectronic devices.
03.09 Analyze and measure characteristics of Operational Amplifiers (OpAmp).
03.10 Describe Integrated Circuits: importance, construction, and application in digital and linear circuits.
03.11 Set up and operate multimeters for solid state devices.
03.12 Set up and operate oscilloscopes for solid state devices.
03.13 Set up and operate curve tracers for solid state devices.
03.14 Set up and operate transistor testers for solid state devices.

04.0 DEMONSTRATE PROFICIENCY IN ELECTRONIC CIRCUITS THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF TOOLS AND TEST EQUIPMENT, AND TROUBLESHOOTING PROCEDURES--The student will be able to:

04.01 Draw, analyze, construct, and troubleshoot diode circuits.
04.02 Draw, analyze, construct, and troubleshoot power supply, regulator, and filter circuits.
04.03 Draw, analyze, construct, and troubleshoot single-stage amplifier circuits.
04.04 Draw, analyze, construct, and troubleshoot multi-stage amplifier circuits.
04.05 Draw, analyze, construct, and troubleshoot oscillator circuits.
04.06 Draw, analyze, construct, and troubleshoot wave-shaping circuits.
04.07 Draw, analyze, construct, and troubleshoot operational amplifier circuits.
04.08 Draw, analyze, construct, and troubleshoot active filter circuits.
04.09 Set up and operate multimeters for analog circuits.
04.10 Set up and operate oscilloscopes for analog circuits.
04.11 Set up and operate frequency counters for analog circuits.
04.12 Set up and operate signal generators for analog circuits.
04.13 Set up and operate transistor testors for analog circuits.

05.0 DEMONSTRATE PROFICIENT SOLDERING AND CHASSIS ASSEMBLY TECHNIQUES--The student will be able to:

05.01 Select, maintain, and use soldering and desoldering tools.
05.02 Use solders with different tin/lead percentages.
05.03 Solder conductors and components to: turret, cup, bifurcated, hooked, pierced terminals and connectors.
05.04 Solder axial lead components to Printed Circuit (PC) boards.
05.05 Remove components and conductors from terminals without damage, including: IC's, TO-5, transistors, diodes, transformers and controls.
05.06 Repair damaged PC board circuitry.

06.0 DEMONSTRATE PROFICIENCY IN ANALYSIS METHODOLOGY--The student will be able to:

06.01 Analyze circuits using: Kirchoff's Current, and Voltage Laws, Superposition, Thevenin's and Norton's Theorems, "T", "Pi", and Bridge Networks.
06.02 Analyze circuits using Wheatstone and LCR Bridge.

07.0 DEMONSTRATE PROFICIENCY IN DIGITAL CIRCUITS AND DEVICES THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF TOOLS AND TEST EQUIPMENT AND TROUBLESHOOTING PROCEDURES--The student will be able to:

07.01 Identify number systems and solve digital math problems using: binary, octal, and hexadecimal radix; and solve boolean algebra problems.
07.02 Identify characteristics of Integrated Circuits (IC) logic families using: Resistor-Transistor Logic (RTL), Diode-Transistor Logic (DTL), Transistor-Transistor Logic (TTL), Emitter-Coupled Logic (ECL), MOS, and Complementary-MOS.

07.03 Draw, analyze, construct and troubleshoot OR/NOR, AND/NAND, XOR gates.
07.04 Analyze and minimize logic circuits using: Boolean Algebra and Karnaugh Maps.
07.05 Draw, analyze, construct and troubleshoot Flip-Flops and Latches circuits using: "R-S", "D", "T", and "J-K devices.
07.06 Draw, analyze, construct and troubleshoot clock and timing circuits.
07.07 Draw, analyze, construct and troubleshoot registers and counters.
07.08 Draw, analyze, construct and troubleshoot arithmetic circuits.
07.09 Draw, analyze, construct and troubleshoot combinational logic circuits.
07.10 Draw, analyze, construct and troubleshoot encoders and decoders.
07.11 Draw, analyze, construct and troubleshoot multiplexers and demultiplexers.
07.12 Draw, analyze, construct and troubleshoot memory circuits.
07.13 Draw, analyze, construct and troubleshoot analog-to-digital and digital-to-analog circuits.
07.14 Draw, analyze, construct and troubleshoot display circuits.
07.15 Set up and operate multimeters for digital circuits.
07.16 Set up and operate logic probes and pulsers for digital circuits.
07.17 Set up and operate oscilloscopes for digital circuits.
07.18 Set up and operate logic/data analyzers for digital circuits.

08.0 DEMONSTRATE PROFICIENCY IN MICROPROCESSORS THROUGH PROBLEM SOLVING, USE OF CIRCUIT DIAGRAMS AND SCHEMATICS, IDENTIFICATION AND APPLICATION OF COMPONENTS AND CIRCUITS, USE OF TOOLS AND TEST EQUIPMENT, AND TROUBLESHOOTING PROCEDURES--The student will be able to:

08.01 Analyze architecture of a Microprocessor Unit (MPU).
08.02 Analyze functions of a MPU.
08.03 Analyze theory and operation of a MPU.
08.04 Analyze instruction set of a MPU.
08.05 Operate MPU system.
08.06 Write, debug, and execute programs using MPU instruction set.
08.07 Apply input/output (I/O) techniques.
08.08 Analyze MPU system hardware.
08.09 Troubleshoot MPU system hardware.
08.10 Draw and analyze MPU system interface circuits.
08.11 Construct and troubleshoot MPU system interface circuits.
08.12 Set up and operate DVM for MPU system measurements.
08.13 Set up and operate logic probes for MPU system measurements (TTL-CMOS compatible; memory; 10MHZ.)
08.14 Set up and operate pulser probes for MPU system measurements.
08.15 Set up and operate oscilloscopes for MPU system measurements (Minimum 60MHZ).
08.16 Set up and operate logic/data analyzers for MPU system measurements (Minimum 16 channels).
08.17 Set up and operate pulse generators for MPU system measurements.
08.18 Set up and operate frequency counters for MPU system measurements (0-200MHZ).

09.0 DEMONSTRATE PROFICIENCY IN PREPARING TECHNICAL RECORDS AND REPORTS--The student will be able to:

09.01 Prepare equipment performance reports using manufacturers data and systems specifications.
09.02 Requisition electronics components.

10.0 IDENTIFY, USE, AND MAINTAIN LASERS AND LASER SYSTEMS--The student will be able to:

10.01 Perform and demonstrate laser safety practices.
10.02 Define and analyze the elements and operation of a laser.
10.03 Analyze, demonstrate the use and operation of a power meter.
10.04 Demonstrate and perform the cleaning of optical materials.
10.05 Identify and demonstrate the use of component supports.
10.06 Analyze, demonstrate the use of filters and beamsplitters.
10.07 Define, analyze the properties of light.
10.08 Measure, analyze the emission and absorption of light.
10.09 Identify and analyze lasing action.
10.10 Identify, analyze and define optical cavities and modes of oscillation.

11.0 DEMONSTRATE AND PRACTICE THE USES OF OPTICAL ELEMENTS--The student will be able to:

11.01 Describe and analyze temporal characteristics.
11.02 Describe and analyze spatial characteristics.
11.03 Perform and analyze the characteristics of a gas laser.
11.04 Define laser classifications and characteristics.
11.05 Demonstrate reflection and ray tracing.
11.06 Demonstrate principles of refraction.
11.07 Demonstrate refraction and ray tracing.
11.08 Demonstrate imaging with a single lens.
11.09 Demonstrate imaging with a multiple lens.
11.10 Demonstrate the effect of F-stop and aperatures.
11.11 Construct and demonstrate the use of an optical system.

12.0 DEMONSTRATE AND ANALYZE WAVE OPTICAL SYSTEMS--The student will be able to:

12.01 Identify and analyze light sources and their characteristics.
12.02 Define and describe the quantities of radiometric and photometric in the radiation of energy/power.
12.03 Describe and define the wave nature of light.
12.04 Demonstrate the effects of reflection and refraction.
12.05 Demonstrate the effects of propagation of light.
12.06 Demonstrate the interference light.
12.07 Demonstrate the diffraction of light.
12.08 Demonstrate the polarization of light.
12.09 Demonstrate and use polarizers.
12.10 Demonstrate and construct a holography system.

13.0 PERFORM LASER TECHNOLOGY APPLICATIONS--The student will be able to:

13.01 Describe the operation, characteristics, and components required to accomplish laser welding.
13.02 Demonstrate the dynamic cutting and drilling.
13.03 Demonstrate and define the use of data recordings and manipulating.
13.04 Demonstrate and define environmental testing and monitoring.
13.05 Demonstrate and define nondestructive testing.
13.06 Demonstrate and define range finding.
13.07 Demonstrate and define alignment and angle testing.
13.08 Define and demonstrate lasers in medicine, surgery and dentistry.
13.09 Demonstrate, perform and construct laser communication system.
13.10 Demonstrate and define lasers in construction.

14.0 CALIBRATE, TROUBLESHOOT, ANALYZE LASER PERIPHERAL COMPONENTS--The student will be able to:

14.01 Define different properties and types of optical materials.
14.02 Define and demonstrate the limitations of optical materials.
14.03 Define and demonstrate windows and flats.
14.04 Define and demonstrate mirrors and etalons.
14.05 Demonstrate and analyze prisms.
14.06 Demonstrate and analyze the use of lenses.
14.07 Demonstrate and analyze the use of gratings.
14.08 Demonstrate and define non-linear materials.
14.09 Demonstrate the use of beam expanders and spatial filters.
14.10 Demonstrate the use of isolators.
14.11 Demonstrate and define spatial resolution of optical systems.

15.0 DEMONSTRATE AND PRACTICE LASER ENERGY APPLICATIONS--The student will be able to:

15.01 Demonstrate and define laser safety, hazards and evaluation.
15.02 Troubleshoot and analyze pulsed laser flashlamps and power supplies.
15.03 Troubleshoot and perform the use of power sources of CW lasers.
15.04 Troubleshoot and perform the use of CW solid lasers-efficiency and cooling.
15.05 Troubleshoot and perform laser power and energy management.
15.06 Demonstrate and perform laser beam divergence and focusing.
15.07 Troubleshoot and define optically pumped CW solid lasers.
15.08 Troubleshoot and define optically pumped pulsed solid lasers.
15.09 Troubleshoot and define laser Q-switching.
15.10 Demonstrate and define semiconductor lasers.

16.0 ANALYZE, CONSTRUCT AND DEMONSTRATE LASER OPTICAL MEASUREMENTS--The student will be able to:

16.01 Demonstrate and analyze electro-optic modulator.
16.02 Demonstrate and analyze acousto-optic devices.
16.03 Demonstrate and define mode-locking.
16.04 Construct and analyze wave characteristics by using various interferometers.

17.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

17.01 Conduct a job search.
17.02 Secure information about a job.
17.03 Identify documents which may be required when applying for a job interview.
17.04 Complete a job application form correctly.
17.05 Demonstrate competence in job interview techniques.
17.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
17.07 Identify acceptable work habits.
17.08 Demonstrate knowledge of how to make job changes appropriately.
17.09 Demonstrate acceptable employee health habits.

18.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

18.01 Define entrepreneurship.
18.02 Describe the importance of entrepreneurship to the American economy.
18.03 List the advantages and disadvantages of business ownership.
18.04 Identify the risks involved in ownership of a business.
18.05 Identify the necessary personal characteristics of a successful entrepreneur.
18.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Lathing

CODE NUMBER: Secondary ______ Postsecondary BCT0159

Florida CIP IN46.020101

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-17

CERTIFICATION COVERAGE: TEC CONSTR @ 7 LATHING 7 BLDG CONST @ 7
DRYWALL 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as lathers (61082002), or to provide supplemental training for persons previously or currently employed in this occupation.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, blueprint reading and interpretation, estimating, and the installation of interior and exterior wall systems and lathing.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the use of tools, equipment and materials in the installation of interior and exterior lathing, furring and wall systems.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 450 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Read and interpret blueprints and schematics.
02. Demonstrate understanding of prevailing building codes.
03. Identify and select appropriate materials for specific jobs.
04. Erect scaffolds and ladders.
05. Install interior lathing and furring to American National Standards specifications.
06. Install exterior wall systems.
07. Develop material and cost estimates.
08. Install suspended ceiling framework.
09. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS

LATHING

01.0 READ AND INTERPRET BLUEPRINTS AND SCHEMATICS — The student will be able to:

01.01 Identify electrical symbols.
01.02 Read engineers' scale.
01.03 Read and interpret blueprints and specifications.
01.04 Identify lines and symbols.
01.05 Read architect's scales.
01.06 Interpret legends on blueprints.

02.0 DEMONSTRATE UNDERSTANDING OF PREVAILING BUILDING CODES — The student will be able to:

02.01 Interpret and apply industry safety codes.
02.02 Select materials to trade standards.
02.03 Read and follow manufacturer's recommendations for material application and use.
02.04 Interpret and apply state standard building code.

03.0 IDENTIFY AND SELECT APPROPRIATE MATERIALS FOR SPECIFIC JOBS — The student will be able to:

03.01 Select lath base compatible to different plaster systems.
03.02 Erect horizontal metal framework to fasten lath using bolts, and power-actuated fastening guns.
03.03 Apply adhesives or caulking in accordance with manufacturer's recommendations.
03.04 Install gypsum lath to walls and ceilings using adhesives, nails or screws.
03.05 Smooth edges of gypsum lath using rasp or sand paper.
03.06 Measure and cut gypsum lath with utility knife and straightedge.
03.07 Measure and cut gypsum lath to fit openings and projections.

04.0 ERECT SCAFFOLDS AND LADDERS — The student will be able to:

04.01 Erect and use extension ladders.
04.02 Erect scaffolds.

05.0 INSTALL INTERIOR LATHING AND FURRING TO AMERICAN NATIONAL STANDARDS SPECIFICATIONS — The student will be able to:

05.01 Layout interior wall systems in accordance with specifications and blueprints.
05.02 Layout interior ceiling systems in accordance with specifications and blueprints.
05.03 Fasten metal lath to walls and ceilings.
05.04 Fasten gypsum lath to walls and ceilings.
05.05 Provide anchor for furring in floor, ceiling and walls.
05.07 Nail on lathing materials.
05.08 Fasten lath using handtools and portable power tools.
05.09 Shim or fur uneven or damaged surfaces to provide insulation space or moisture barrier by using metal and wood furring.
05.10 Weld metal frame supports to steel structural members.
05.11 Install metal casings door frame and frames.
05.12 Install suspended carriers or channels to overhead structural framework.
05.13 Attach preformed corner reinforcements.
05.14 Bend and shape metal lath.
05.15 Wire, nail, clip, or staple lath to framework, ceiling joists, and flat concrete surfaces.
05.16 Wire horizontal strips to furring.

06.0 INSTALL EXTERIOR WALL SYSTEMS — The student will be able to:

06.01 Layout exterior wall systems in accordance with specifications and blueprints.
06.02 Layout exterior celing systems in accordance with specifications and blueprints.
06.03 Erect and install exterior studding.
06.04 Install exterior gypsum sheeting.
06.05 Apply and install K-lath, strip lath, and paperback metal lath.
06.06 Layout and install exterior trim, plaster accessories, and plastering grounds.
06.07 Fasten exterior systems by welding, screwing, driving, or tieing.
06.08 Install and erect knee or walls, curtain walls or perapet walls.

07.0 DEVELOP MATERIAL AND COST ESTIMATES — The student will be able to:

07.01 Analyze and project material costs.
07.02 Estimate quantities.

08.0 INSTALL SUSPENDED CEILING FRAMEWORK — The student will be able to:

08.01 Layout ceilings in accordance with plans and specifications.
08.02 Install suspension systems.
08.03 Install carriers and runners.
08.04 Frame furring to reflected ceiling plans.
08.05 Install plaster base, grounds, trims, or accessories.
08.06 Install accoustical ceiling and grid system.
08.07 Install accoustical ceiling accessories and trim.
08.08 Install acoustical tiles or panels.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS—The student will be able to:

09.01 List sources of job openings other than public or private employment agencies.
09.02 Write a letter of application for a job.
09.03 Prepare a vita, resume or personal fact sheet.
09.04 List factors to consider when applying for a job.
09.05 List ways of making contact with employers.
09.06 Identify documents which may be required when applying for a job interview.
09.07 Complete a job application form correctly.
09.08 Identify appropriate dress and grooming for job interview.
09.09 Classify behaviors considered appropriate or inappropriate in a job interview situation.
09.10 Describe advantages to employer and employees of being a productive worker.
09.11 Explain the purpose of supervision, self discipline and performance evaluation.
09.12 Identify appropriate response (s) to criticism from employer supervisor or other employees.
09.13 List consequences of being absent frequently from the job.
09.14 List consequences of frequently arriving late for work.
09.15 List factors to consider when resigning from a job.
09.16 Write a letter of resignation.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Major Appliance and Refrigeration Repair

CODE NUMBER: Secondary ______ Postsecondary ACR0800

Florida CIP IN47.010600

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-17

CERTIFICATION COVERAGE: WASH MACH @ 7 APPLI REPR 7
GAS FITTER 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as gas and electric appliance repairers (50082005), all other mechanics and repairers (50083299), laundry machine mechanics (629.261-010), window air conditioner servicers (637.261-010), appliance servicers (637.261-018), appliance service representatives (827.261-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, electrical and refrigeration skills, analyzing, diagnosing and repairing washers, dryers, dishwashers, trash compactors, ranges, refrigerators, freezers, microwave ovens, and window air conditioners.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in fundamentals of electricity and refrigeration, identifying, analyzing, and diagnosing gas and electric appliance system problems, disassembling and reassembling appliances, and servicing appliances.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1890 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply basic appliance repair skills.
02. Apply basic electrical skills.
03. Apply basic refrigeration skills.
04. Perform major appliance repair work.
05. Perform window air-conditioner repair work.
06. Demonstrate employability skills.
07. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial SECONDARY NUMBER: ________

PROGRAM TITLE: Major Appliance and Refrigeration Repair POSTSECONDARY NUMBER: ACR0800

01.0 APPLY BASIC APPLIANCE REPAIR SKILLS--The student will be able to:

01.01 Apply communications and leadership techniques.
01.02 Apply human relations skills.
01.03 Apply basic math skills.
01.04 Identify safety practices.
01.05 Identify hand, power, and special tools.
01.06 Identify tubing, pipe, and fittings.
01.07 Apply soldering and brazing techniques.

02.0 APPLY BASIC ELECTRICAL SKILLS--The student will be able to:

02.01 Identify nature of electricity.
02.02 Identify magnetism and electromagnetism induction.
02.03 Identify electrical diagrams, symbols, and components.
02.04 Identify electrical codes and safety procedures.
02.05 Apply basic electrical theory and calculations.
02.06 Measure electrical values.
02.07 Compare alternating to direct current.
02.08 Test electrical components.
02.09 Test single and three phase motors.
02.10 Test capacitors.
02.11 Identify solid state components.
02.12 Trouble diagnose electrical circuits.

03.0 APPLY BASIC REFRIGERATION SKILLS--The student will be able to:

03.01 Identify basic refrigeration fundamentals.
03.02 Identify basic refrigeration cycle.
03.03 Compare refrigerants and their characteristics.
03.04 Identify refrigerant safety procedures.
03.05 Analyze refrigeration systems.
03.06 Apply dehydration and charging procedures.
03.07 Locate and repair refrigeration system leaks.
03.08 Locate and repair refrigeration system leaks.
03.09 Trouble diagnose refrigeration systems.

04.0 PERFORM MAJOR APPLIANCE REPAIR WORK--The student will be able to:

04.01 Analyze appliance mechanical systems.
04.02 Analyze water pumping systems.
04.03 Test electrical systems components.
04.04 Install and repair washer system-single direction.
04.05 Install and repair single speed reversible washer.
04.06 Install and repair two-speed reversible washer.
04.07 Install and repair dryer system-minute timer.
04.08 Install and repair halo heat dryer system.
04.09 Install and repair front drum slides.
04.10 Install and repair gas dryer-automatic igniting.
04.11 Install and repair gas dryers-constant pilot.
04.12 Install and repair diswasher power module.
04.13 Install and repair dishwasher reverse and single direction motors.
04.14 Install and repair jackscrew and scissors run trash compactor.
04.15 Install and repair garbage disposal.
04.16 Install and repair free standing electric range.
04.17 Install and repair self-cleaning electric range.
04.18 Install and repair gas range.
04.19 Analyze and repair range door lock devices.
04.20 Repair mechanical and digital timers in microwave ovens.
04.21 Test high and low microwave voltage system.
04.22 Install and repair manual defrost and no-frost refrigerators.
04.23 Analyze cabinet components of refrigerator.
04.24 Install ice maker.
0425 Install and repair freezer.

05.0 PERFORM WINDOW AIR-CONDITIONER REPAIR WORK--The student will be able to:

05.01 Analyze and test 120 volt electrical system.
05.02 Analyze and test 230 volt electrical system.

05.03 Replace freon.
05.04 Check system pressure.
05.05 Analyze and check reverse air system.
05.06 Replace system components.

06.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

06.01 Conduct a job search.
06.02 Secure information about a job.
06.03 Identify documents which may be required when applying for a job interview.
06.04 Complete a job application form correctly.
06.05 Demonstrate competence in job interview techniques.
06.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
06.07 Identify acceptable work habits.
06.08 Demonstrate knowledge of how to make job changes appropriately.
06.09 Demonstrate acceptable employee health habits.

07.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

07.01 Define entrepreneurship.
07.02 Describe the importance of entrepreneurship to the American economy.
07.03 List the advantages and disadvantages of business ownership.
07.04 Identify the risks involved in ownership of a business.
07.05 Identify the necessary personal characteristics of a successful entrepreneur.
07.06 Identify the business skills needed to operate a small business efficiently and effectively.

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Manufacturing Technology

CODE NUMBER: Secondary _______ Postsecondary ETI0400

Florida CIP IN15.060400

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-15

CERTIFICATION COVERAGE: TEC MECH @ 7 TEC PROD @ 7 IND ENGR 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as all other engineering technicians (10081898), production planners (012.167-050), material schedulers (012.187-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and a combination of theory and laboratory activities to gain the necessary cognitive and manipulative skills to analyze data, make resource utilization decisions and manage a manufacturing oriented facility.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in computer control, technical communications, maintenance of electromechanical components, quality control, material handling, and time and motion studies.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 12.0, Language 12.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 2400 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Plan and schedule production processing and material utilization.
02. Develop employee job standards and conduct time and motion and cost control studies.
03. Perform purchasing and resource identification activities.
04. Perform computer control functions.
05. Plan, develop and implement communication processes.
06. Maintain electromechanical components.
07. Develop and implement processes for material handling and quality control and reliability.
08. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS

MANUFACTURING TECHNOLOGY

01.0 PLAN AND SCHEDULE PRODUCTION PROCESSING AND MATERIAL UTILIZATION — The student will be able to:

01.01 Schedule jobs.
01.02 Requisition materials.
01.03 Organize assembly lines.
01.04 Assign personnel to equipment and positions.
01.05 Control shop flow of jobs.
01.06 Conduct in-process inspectors.
01.07 Direct assembly of components into final products.
01.08 Conduct final test and inspection.
01.09 Direct packaging.
01.10 Direct shipping or transfer to customer or warehouse.

02.0 DEVELOP EMPLOYEE JOB STANDARDS AND CONDUCT TIME AND MOTION AND CEST CENTRAL STUDIES — The student will be able to:

02.01 Conduct time and motion studies.
02.02 Establish and write employee job standards.
02.03 Develop cost central data.
02.04 Analyze cost central reports.
02.05 Analyze production methods and processes.
02.06 Analyze and intergrate processes into total systems.
02.07 Write job descriptions.
02.08 Complete job status reports.
02.09 Analyze job evaluation.

03.0 PERFORM PURCHASING AND RESOURCE IDENTIFICATION ACTIVITIES — The student will be able to:

03.01 Advise on 'make or buy' decisions.
03.02 Identify services of supply.
03.03 Obtain bids or quotations.
03.04 Select vendor.
03.05 Prepare and issue purchase requisition.
03.06 Receive and inspect incoming materials.
03.07 Average distribution of materials.

04.0 PERFORM COMPUTER CONTROL FUNCTIONS — The student will be able to:

04.01 Make computer application analysis.
04.02 Process CAD/CAM Program.
04.03 Write a program.
04.04 Program mico-processors.
04.05 Make adjustments to programs.
04.06 Evaluate robotic applications.

05.0 PLAN, DEVELOP, AND IMPLEMENT COMMUNICATIONS — The students will be able to:

05.01 Write production reports.
05.02 Write technical reports.
05.03 Illustrate report with charts,diagrams and graphs.
05.04 Prepare and deliver report.
05.05 Plan technical training for employees.

06 MAINTAIN ELECTROMECHANICAL COMPONENTS — The student will be able to:

06.01 Interput blue prints, schematics, and technical manuals.
06.02 Establish operating maintenance schedule.
06.03 Analyze system failures.
06.04 Make minor repairs in equipement.
06.05 Coordinate maintenance services.
06.06 Evaluate need for equipment replacement.

07.0 IMPLEMENT PROCESSES FOR MATERIAL HANDING AND QUALITY CONTROL — The student will be able to:

07.01 Establish system for handling and storing material in process.
07.02 Establish a system for handling and storing finished material.

07.03 Develop quality control.
07.04 Prepare deviations from specifications evaluation.
07.05 Investigate equipment failures.
07.06 Conduct quality tests under varying environmental conditions.

08.0 DEMONSTRATE EMPLOYABILITY SKILLS — The student will be able to:

08.01 List sources of job openings other than public or private employment agencies.
08.02 Write a letter of application for a job.
08.03 Prepare a vita, resume or personal fact sheet.
08.04 List factors to consider when applying for a job.
08.05 List ways of making contact with employers.
08.06 Identify documents which may be required when applying for a job inview.
08.07 Complete a job application form correctly.
08.08 Identify appropriate dress and grooming for job interview.
08.09 Classify behaviors considered appropriate or inappropriate in a job interview situation.
08.10 Describe advantages to employer and employees of being a productive worker.
08.11 Explain the purpose of supervision, self discipline and performance evaluation.
08.12 Identify appropriate response (s) to criticism from employer supervisor or other employees.
08.13 List consequences of being absent frequently from the job.
08.14 List consequences of frequently arriving late for work.
08.15 List factors to consider when resigning from a job.
08.16 Write a letter of resignation.

CURRICULUM FRAMEWORK — PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION — EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Marine Mechanics

CODE NUMBER: Secondary ____________ Postsecondary MTE0991

Florida CIP IN49.030600

SECONDARY SCHOOL CREDITS _______ COLLEGE CREDITS _______ POSTSECONDARY ADULT VOCATIONAL CREDITS ________

APPLICABLE LEVELS(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 13-17

CERTIFICATION COVERAGE: DESEL MECH 7 MRTBT MECH @ 7 GASENG RPR 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as marine mechanics/deck engineers (623.281-010), outside machinist apprentices (623.281-022), outside machinists (623.281-030), engine maintenance mechanics (623.281-034), marine engine mechanics (623.281-026), outboard motor mechanics (623.281-042), motor boat mechanic helpers (623.684-010), and boat riggers (806.464-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, service, repair, and overhaul of 4-stroke and 2-stroke cycle engines and outboard motors, to include electrical systems, fuel systems, power transfer systems, ignition systems, cooling systems, lubrication systems, drive systems, boat and trailer rigging, and service and repair of boating accessories.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in tools, test equipment, welding procedures, current model outboard motors, inboard-outboard motors, and operational testing.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communications, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 contact hours (2160 clock hours).

IV. INTENDED OUTCOMES: After sucessfully completing this program, the individual will be able to:

01. Perform shop practices to industry standards
02. Maintain and repair basic 4-stroke cycle engines
03. Maintain and repair 4-stroke cycle diesel engines (optional)
04. Maintain and repair basic 2-stroke cycle engines
05. Maintain and repair electrical systems
06. Maintain and repair cranking systems
07. Maintain and repair ignition systems
08. Maintain and repair charging systems
09. Maintain and repair fuel systems
10. Maintain and repair cooling systems
11. Maintain and repair lubrication systems
12. Maintain and repair outdrives, transmissions, and intermediate housings
13. Assemble and maintain outboard lower units and housing assemblies
14. Use marine woods, metals, and fiber glass
15. Adjust and repair trailers
16. Prepare and deliver sales merchandise
17. Demonstrate employability skills
18. Demonstrate an understanding of entrepreneurship

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education — SECONDARY NUMBER: ____________

PROGRAM TITLE: Marine Mechanics — POSTSECONDARY NUMBER: MTE0991

01.0 PERFORM SHOP PRACTICES TO INDUSTRY STANDARDS--The student will be able to:

01.01 Comply with safety rules and regulations
01.02 Use hand tools safely and properly
01.03 Set up and use power tools safely and properly
01.04 Set up and use precision measuring tools
01.05 Drill and remove broken studs and install helicoils
01.06 Identify threaded fasteners by size, type, thread series, thread classes, material hardness, and compatibility
01.07 Identify and make gaskets and seals
01.08 Read and use parts manuals
01.09 Read, interpret, and apply service manuals
01.10 Locate and match electrical units by their symbols on a wiring diagram

02.0 MAINTAIN AND REPAIR BASIC 4-STROKE CYCLE ENGINES--The student will be able to:

02.01 Explain the basic principles of the operation of 4-stroke cycle internal combustion engines
02.02 Identify types of 4-stroke cycle engines
02.03 Locate engine serial and model numbers
02.04 Identify engine assemblies and systems
02.05 Diagnose valve and head problems by use of the visual inspection method
02.06 Diagnose valve and head problems by use of the compression tester method
02.07 Diagnose valve and head problems by use of the cylinder air pressure method
02.08 Diagnose valve and head problems by use of the stethoscope method
02.09 Disassemble engines and inspect parts
02.10 Clean and inspect heads for cracks, warpage, and damaged spark plug threads
02.11 Inspect valves for warpage, burns, cracks, stem wear, tip wear, and margin
02.12 Grind valve seats and reface valves
02.13 Check and inspect springs for free height, distortion, and installed height
02.14 Adjust valve lash
02.15 Move and inspect camshafts and lifters
02.16 Measure camshafts
02.17 Service camshaft bearings
02.18 Clean and inspect lifters for wear
02.19 Time valve drive assemblies
02.20 Remove pistons from rod assemblies
02.21 Measure out-of-round and cylinder taper with a dial bore gauge or micrometer
02.22 Check piston pins and bosses for wear
02.23 Measure piston ring lands width, out-of-round, and taper
02.24 Measure the piston ring gap in cylinder bores
02.25 Install and fit piston pins
02.26 Check rod and piston assembly alignment
02.27 Remove and replace rod bearings
02.28 Hone and clean cylinders
02.29 Install rings on pistons
02.30 Measure and check crankshafts with a micrometer
02.31 Check for end play
02.32 Check bearing bores with a telescoping gauge
02.33 Reassemble engines
02.34 Install oil seals

03.0 MAINTAIN AND REPAIR 4-STROKE CYCLE DIESEL ENGINES (OPTIONAL)--The student will be able to:

03.01 Explain the basic principles of the operation of 4-stroke cycle diesel engines
03.02 Identify types of 4-stroke cycle engines
03.03 Locate engine serial and model numbers

03.04 Identify engine assemblies and systems
03.05 Diagnose valve and head problems by use of the visual inspection method
03.06 Diagnose valve and head problems by use of the compression tester method
03.07 Diagnose valve and head problems by use of the cylinder air pressure method
03.08 Diagnose valve and head problems by use of the stethoscope method
03.09 Disassemble engines
03.10 Clean and inspect heads for cracks, warpage, and damaged spark plug threads
03.11 Inspect valves for warpage, burns, cracks, stem wear, tip wear, and margin
03.12 Grind valve seats and reface valves
03.13 Check and inspect springs for free height, distortion, and installed height
03.14 Adjust valve lash
03.15 Remove and inspect camshafts and lifters
03.16 Measure camshafts
03.17 Service camshaft bearings
03.18 Clean and inspect lifters for wear
03.19 Time valve drive assemblies
03.20 Remove pistons from rod assemblies
03.21 Measure out-of-round and cylinder taper with a dial bore gauge or micrometer
03.22 Check piston pins and bosses for wear
03.23 Measure piston ring lands width, out-of-round and taper
03.24 Measure the piston ring gap in cylinder bores
03.25 Install and fit piston pins
03.26 Check rod and piston assembly alignment
03.27 Remove and replace rod bearings
03.28 Hone and clean cylinders
03.29 Install rings on pistons
03.30 Measure and check crankshafts with a micrometer
03.31 Check for end play
03.32 Check bearing bores with a telescoping gauge
03.33 Reassemble engines
03.34 Install oil seals

04.0 MAINTAIN AND REPAIR BASIC 2-STROKE CYCLE ENGINES--The student will be able to:

04.01 Explain the basic principles of the operation of 2-stroke cycle internal combustion engines
04.02 Identify types of engines
04.03 Locate engine serial and model numbers
04.04 Identify engine assemblies and systems
04.05 Disassemble engines
04.06 Remove, clean, and inspect heads for cracks, warpage, and damaged spark plug threads
04.07 Diagnose head problems by use of the visual inspection method
04.08 Diagnose head problems by use of the compression tester method
04.09 Diagnose head problems by use of the cylinder air pressure method
04.10 Diagnose head problems by use of the stethoscope method
04.11 Remove, clean, and inspect piston rods and assemblies
04.12 Measure out-of-round of pistons and cylinders
04.13 Hone cylinders
04.14 Check the total bearing surface of connecting rod bearings
04.15 Measure piston skirts and ring grooves
04.16 Measure the piston ring gap in cylinder bores
04.17 Install piston pins according to manufacturer's specifications
04.18 Check rod and piston assembly alignment
04.19 Install rings on pistons
04.20 Install piston rod assemblies
04.21 Measure and check crankshafts with a micrometer
04.22 Check needle bearings
04.23 Inspect crankshafts and install seals
04.24 Inspect, clean, and/or replace reed valves
04.25 Reassemble engines

05.0 MAINTAIN AND REPAIR ELECTRICAL SYSTEMS--The student will be able to:

05.01 Set up and use voltmeters, ammeters, and ohmmeters
05.02 Locate and identify electrical circuit components
05.03 Sketch a typical circuit using a single wire system
05.04 Test storage batteries using a hydrometer
05.05 Test storage batteries using a light and load test
05.06 Charge storage batteries
05.07 Remove and replace batteries and service battery boxes
05.08 Repair damaged wire and electrical harnesses
05.09 Diagnose circuit troubles using continuity or a test light and low reading voltmeters to record voltage drop
05.10 Sketch and label typical fuel gauge systems
05.11 Remove and replace ampmeters or indicating lights
05.12 Remove and replace fuel gauges
05.13 Remove and replace fuel sending units
05.14 Diagnose gauges and accessory system troubles using test lights, voltmeters, ampmeters, or detached sending units
05.15 Sketch typical circuits such as those for auto bilge pumps or navigation lights
05.16 Locate opens, shorts, and grounds

06.0 MAINTAIN AND REPAIR CRANKING SYSTEMS--The student will be able to:

06.01 Disassemble recoil starters
06.02 Inspect components of recoil starters
06.03 Reassemble recoil starters
06.04 Identify components of electrical starting systems
06.05 Disassemble different types of starting motors
06.06 Bench test armatures
06.06 Bench test field coils
06.08 Bench test drive units
06.09 Bench test switches
06.10 Bench test minor parts of starting motor components
06.11 Use armature lathes for turning commutators
06.12 Install, reassemble, and test new starter parts
06.13 Troubleshoot starting systems using battery-starter testers
06.14 Troubleshoot starting systems using voltmeters for finding excessive voltage drop
06.15 Recondition solenoids, drives, and other components
06.16 Set up and use battery-starter (load) testers
06.17 Locate opens, shorts, and grounds

07.0 MAINTAIN AND REPAIR IGNITION SYSTEMS--The student will be able to:

07.01 **Maintain and Repair Magneto Ignition Systems**
07.02 Sketch and label electrical symbols
07.03 Set up and use ohmmeters
07.04 Set up and use voltmeters
07.05 Set up and use ignition testers
07.06 Set up and use ignition analyzers
07.07 Locate and identify parts of magneto ignitions
07.08 Locate and match electrical units by their symbols on a wiring diagram
07.09 Sketch and label complete magneto ignition systems
07.10 Check coil resistance with an ohmmeter
07.11 Check points for continuity and resistance
07.12 Check condensers for capacity, leaks, and shorts
07.13 Clean and regap spark plugs
07.14 **Maintain and Repair Battery Ignition Systems**
07.15 Locate and identify parts of battery ignitions
07.16 Locate and match electrical units by their symbols on a wiring diagram
07.17 Sketch and label complete battery ignition systems
07.18 Check coil resistance with an ohmmeter
07.19 Check points for continuity and resistance
07.20 Check condensers for capacity, leaks, and shorts
07.21 Set up and use test equipment
07.22 Set timing using a timing light
07.23 **Maintain and Repair Capacitor Discharge Ignition Systems**
07.24 Sketch and label electrical symbols
07.25 Set up and use ohmmeters
07.26 Set up and use a CD-77

07.27 Set up and use spark testers
07.28 Set up and use neon test lights
07.29 Set up and use low/high ampmeters
07.30 Set up and use voltmeters
07.31 Locate and identify parts of capacitor discharge ignition systems
07.32 Locate and match electrical units by their symbols on a wiring diagram
07.33 Sketch and label complete C/D ignition systems
07.34 Check coil resistance, shorts, and grounds with an ohmmeter
07.35 Check stator windings with an ohmmeter
07.36 Check sensor coils, charge coils, ignition coils, and shorts to ground with a CD-77
07.37 Check power packs with an ohmmeter and a CD-77

08.0 MAINTAIN AND REPAIR CHARGING SYSTEMS--The student will be able to:

08.01 **Maintain and Repair Outboard Systems**
08.02 Sketch and label the units of complete charging circuits
08.03 Disassemble charging systems and identify the components
08.04 Perform stator and rectifier testing on charging systems
08.05 Reassemble and test charging systems
08.06 Set up and use ohmmeters
08.07 Test regulators
08.08 Reassemble and test complete units
08.09 **Maintain and Repair Inboard/Diesel Systems**
08.10 Inspect, remove, and replace alternator belts
08.11 Check the output of charging systems
08.12 Analyze malfunctions
08.13 Test and overhaul alternators
08.14 Remove and replace regulators

09.0 MAINTAIN AND REPAIR FUEL SYSTEMS--The student will be able to:

09.01 **Maintain and Repair Fuel Systems**
09.02 Identify and locate fuel system components (fuel tanks, lines, filters, etc.)
09.03 Sketch and label the parts of total fuel systems
09.04 Service fuel lines
09.05 Remove, clean, and install fuel tanks
09.06 Identify and locate fuel pump vacuums
09.07 Remove, replace, service, and check the pressure of fuel pumps
09.08 Remove, clean, and replace in-line filters
09.09 Identify the major types of carburetors
09.10 Check and adjust throttle and governor linkages
09.11 **Maintain and Repair Two-stroke Cycle Carburetors**
09.12 Sketch and label the parts of total fuel systems
09.13 Service fuel lines and primer bulbs (vacuum test)
09.14 Remove, clean, inspect, and install fuel tanks
09.15 Identify basic carburetor circuits (chokes; floats; fuel inlets; idle, intermediate, and high speeds; mains, etc.)
09.16 Identify and locate fuel pumps
09.17 Remove, inspect, and replace fuel pumps
09.18 Remove, clean, overhaul, replace, and make final adjustments to carburetors
09.19 Remove, service, and replace air cleaners
09.20 Diagnose carburetor problems
09.21 Remove, inspect, and replace reed valves and gaskets
09.22 Diagnose exhaust problems such as back pressure and scavenging
09.23 Inspect and service oil metering systems
09.24 Determine and make appropriate fuel-oil mixtures
09.25 **Maintain and Repair Inboard Gas Systems**
09.26 Remove, service, and replace carburetor air cleaners/flame arrestors
09.27 Identify and locate fuel system components (fuel pumps, carburetors and air filters, linkages, and intake manifolds)
09.28 Remove, clean, overhaul, replace, and make final adjustments to carburetors
09.29 **Maintain and Repair Inboard Diesel Systems**
09.30 Identify and locate fuel system components (fuel tanks, fuel lines, fuel pumps, air filters, governors and linkages, and fuel injectors)
09.31 Check fuel systems for leaks
09.32 Bleed systems for starting

09.33 Adjust nozzle pressure to manufacturer's specifications
09.34 Set the injection pump angle (timing)
09.35 Check and adjust the throttle and governor linkage
09.36 Check or replace glow plugs
09.37 Check stop solenoids

10.0 MAINTAIN AND REPAIR COOLING SYSTEMS--The student will be able to:

10.01 Explain the principles of cooling systems, including fresh water cooling systems
10.02 Trace water flow through cooling systems
10.03 Remove and replace gear cases
10.04 Disassemble and reassemble water pumps
10.05 Remove, check, and replace thermostats
10.06 Use thermostat pressure relief systems
10.07 Service sea strainers through hull fittings and valve oil coolers and heat exchangers
10.08 Remove and replace circulator pumps
10.09 Remove and rebuild fresh water pumps
10.10 Remove and rebuild inboard sea pumps
10.11 Remove and rebuild inboard/outboard sea pumps
10.12 Service manifolds, risers, and thermostat housings
10.13 Service water cooling systems for gas inboard, gas outboard, and diesel engines

11.0 MAINTAIN AND REPAIR LUBRICATION SYSTEMS--The student will be able to:

11.01 Identify the types and functions of lubrication systems
11.02 Explain the principles of lubrication systems
11.03 Identify and locate components of lubrication systems
11.04 Check engines for oil leaks
11.05 Change engine oil and filters
11.06 Check engine oil pressure and level
11.07 Recognize and use only recommended oil

12.0 MAINTAIN AND REPAIR OUTDRIVES, TRANSMISSION, AND INTERMEDIATE HOUSINGS --The student will be able to:

12.01 **Maintain and Repair Intermediate Housings**
12.02 Disassemble main drive shafts
12.03 Shim drive shafts to intermediate housings
12.04 Remove and replace clutch assemblies
12.05 Check electrical components with proper test equipment
12.06 Remove and replace "U" joints
12.07 Disassemble outer transom plates
12.08 Adjust trim and limit switches
12.09 Disassemble cylinder rams
12.10 **Maintain and Repair Stern Drive Upper Gear Cases**
12.11 Determine the differences between mechanical, electrical, and hydraulic shifting units
12.12 Disassemble and reassemble each type of shifting unit
12.13 Reshim units to manufacturer's specifications
12.14 Use the proper oil to refill upper and lower gear cases
12.15 **Perform Upper to Lower Gear Case Maintenance**
12.16 Disassemble exhaust housings
12.17 Inspect seals, "O" rings, shafts, and bearings
12.18 Reassemble exhaust housings
12.19 **Maintain and Repair Lower Gear Cases**
12.20 Determine the differences between mechanical, electrical, and hydraulic shifting
12.21 Remove and replace lower gear cases
12.22 Reshim lower gear cases
12.23 Refill lower gear cases with specified oil
12.24 Determine propeller pitch, diameter, and hub type
12.25 **Maintain and Repair Transmissions**
12.26 Inspect planetary clutch plate air coupling assemblies
12.27 Remove and replace transmissions
12.28 Use proper service tools in shimming, reassembly, and testing
12.29 **Lubricate Transmissions**
12.30 Drain transmissions
12.31 Determine capacity using the transmission service manuals
12.32 Refill transmissions according to manufacturer's specifications

13.0 ASSEMBLE AND MAINTAIN OUTBOARD LOWER UNITS AND HOUSING ASSEMBLIES --The student will be able to:

13.01 Disassemble and reassemble steering handle groups
13.02 Disassemble and assemble exhaust housings and water tube assembly
13.03 Replace motor mounts and shock absorbers
13.04 Lubricate all fittings
13.05 Pressure and vacuum test gear cases
13.06 Remove and test cylinders and rams
13.07 Adjust reverse locks
13.08 Adjust the trim and tilt
13.09 Determine the differences between mechanical, electrical, and hydraulic shifting units
13.10 Explain the shifting theory of the lower unit
13.11 Disassemble and reassemble mechanical shifting units
13.12 Disassemble and reassemble electrical shifting units
13.13 Disassemble and reassemble hydraulic shifting units
13.14 Inspect all parts for wear

14.0 USE MARINE WOODS, METALS, AND FIBER GLASS--The student will be able to:

14.01 Explain the hazards of a marine environment to woods, metals, and fiber glass
14.02 Explain a galvanic series
14.03 Explain the theory for using given materials in boat repair activities

15.0 ADJUST AND REPAIR TRAILERS--The student will be able to:

15.01 Make boat-to-trailer adjustments
15.02 Remove and replace lighting systems
15.03 Remove and replace wheel bearings and springs
15.04 Remove and replace brakes
15.05 Dissassemble, diagnose, and reassemble trim and tilt systems
15.06 Remove and test cylinder rams
15.07 Adjust reverse locks
15.08 Adust the trim and tilt

16.0 PREPARE AND DELIVER SALES MERCHANDISE--The student will be able to:

16.01 **Install Outboard Motors**
16.02 Make center line measurements
16.03 Center the plate height
16.04 Locate manufacturers' I.D. plates
16.05 **Install Control Boxes**
16.06 Mount control boxes at the helm
16.07 Place wiring and cables in a neat and orderly manner
16.08 **Make Appropriate Adjustments**
16.09 Adjust the control cables from the engine to the control box
16.10 Center the steering cable to the engine
16.11 **Install Accessories**
16.12 Find suitable locations for accessories and mount them to the boat
16.13 Lubricate shafts, install propellers, and fasten both securely
16.14 **Follow and Complete a Servicing Check List**
16.15 Check for proper levels
16.16 Check manufacturers' specifications
16.17 Test-run boats
16.18 Recheck work completed
16.19 **Install Stern Drive Units**
16.20 Check manufacturers' installation procedures
16.21 Lubricate shafts and install propellers securely
16.22 Obtain maximum oil level capacity
16.23 **Prepare Engines**
16.24 Install or connect drain plugs, pet cocks, hose clamps, hoses, etc.
16.25 Find a suitable mount location and mount the engine securely in the boat
16.26 Set engines to manufacturer's specifications
16.27 Set, adjust, and test engines to manufacturer's specifications
16.28 **Install Lighting Systems and Accessories**
16.29 Remove and replace running lights

16.30 Troubleshoot lighting systems and accessories
16.31 Check and adjust throttles, cables, horns, lights, and tachometers

17.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

17.01 Conduct a job search
17.02 Secure information about a job
17.03 Identify documents that may be required when applying for a job
17.04 Complete a job application form correctly
17.05 Demonstrate competence in job interview techniques
17.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
17.07 Identify acceptable work habits
17.08 Demonstrate knowledge of how to make job changes appropriately
17.09 Demonstrate acceptable employee health habits

18.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP

18.01 Define entrepreneurship
18.02 Describe the importance of entrepreneurship to the American economy
18.03 List the advantages and disadvantages of business ownership
18.04 Identify the risks involved in ownership of a business
18.05 Identify the necessary personal characteristics of a successful entrepreneur
18.06 Identify the business skills needed to operate a small business efficiently and effectively

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Marine Propulsion Technology

CODE NUMBER: Secondary ______ Postsecondary MTE0990

Florida CIP IN15.080400

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ________

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

_____ Postsecondary Vocational x Other 13-15

CERTIFICATION COVERAGE: DESEL MECH 7 TEC MECH @ 7 GASENG RPR 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as marine mechanics/deck engineers (623.281.010), diesel engine testers (625.261-010), engine testing supervisor (625.131-010, marine engine mechanics (623.281-026), outboard motor mechanics (623.281-042), motor boat mechanic helpers (623.684-010), and boat riggers (806.464-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and skills to support propulsion officers, and managers of marine units and fleets or to work as manufacturer's representatives of marine propulsion units.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in installation, operation, trouble shooting, diesel and gasoline engines maintenance, propeller selection, corrosion control, and fiber glassing.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communications, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher, and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 contact hours (2160 clock hours).

IV. INTENDED OUTCOMES: After successfuly completing this program the student will be able to:

01. Perform basic shop practices .
02. Describe operational theory of (2) two and (4) four cycle engines - Diesel and Gasoline.
03. Use service manuals and part, reference.
04. Perform basic welding skills.
05. Remove and install engines.
06. Recondition and service engines.
07. Perform diagnosis service-repairs to all types of marine ignition systems.
08. Develop skills in electrical-electronic theory of operation and application.
09. Troubleshoot and repair fuel systems.
10. Service cooling systems.
11. Service exhaust systems.
12. Demonstrate shop management functions.
13. Identify special marine principles.
14. Repair inboard drive systems
15. Rig Boats.
16. Repair lower units.
17. Perform corrosion experiments and understand corrosion control.
18. Fiberglass theory, boat building, and maintenance.
19. Demonstrate and practice employability skills.
20. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial SECONDARY NUMBER ____________

PROGRAM TITLE: Marine Propulsion Technology PROGRAM NUMBER: MTE0990

01.0 PERFORM BASIC SHOP PRACTICES--The student will be able to:

- 01.01 Perform calculations using decimals and fractions to include subtraction, multiplication and division.
- 01.02 Change fractions to decimals and decimals to fractions.
- 01.03 Determine metric system measurements.
- 01.04 Comply with safety rules and regulations.
- 01.05 Operate hand tools safely and properly.
- 01.06 Set up and use power tools safely and properly.
- 01.07 Set up and use precision measuring tools.
- 01.08 Drill and remove borken studs and install helicoils.
- 01.09 Identify threaded fasteners by size, type, thread series, thread classes, material hardness, and compatibility.
- 01.10 Install fasteners such as screws, bolts, and keys; and utilize screw extractor, thread cutting tape, and dies.
- 01.11 Locate and match electrical units by their symbols on a wiring diagram.
- 01.12 Draw performance charts and graphs on propeller selection and engine specifications.

02.0 DESCRIBE OPERATIONAL THEORY OF (2) TWO AND (4) FOUR CYCLE ENGINES--The student will be able to:

- 02.01 Distinguish between the characteristics of four-stroke cycle engine including diesel engines.
- 02.02 Identify basic engine parts.
- 02.03 Describe the functions of the crankshaft.
- 02.04 List the information which may be found on the engine nameplate.
- 02.05 Describe types of motion and simple machines, and characteristics of energy.
- 02.06 Calculate problems using the formula for work, horsepower and torque.
- 02.07 Describe the main theoretical concept of heat engines.
- 02.08 Describe the process by which an internal combustion engine converts chemical energy into rotary motion.
- 02.09 Calculate problems using the formulas for engine cubic displacement and compression ratio.
- 02.10 Discuss the principles of operation of four- and two-stroke cycle engines.
- 02.11 Identify the parts of a camshaft lobe-crankshaft lobe.
- 02.12 Describe valve timing and overlap procedures.
- 02.13 Identify types of valve arrangements.
- 02.14 Identify types of engine construction.
- 02.15 Discuss piston-engine operation, design-loop charged.
- 02.16 Discuss the operation of a two- and four-stroke cycle engines to include diesel engines.
- 02.17 Distinguish different engine design by manufacturers.
- 02.18 Identify marine engine make-up and conversion to-from auto engines.

03.0 USE SERVICE MANUALS AND PART, REFERENCE--The student will be able to:

- 03.01 Demonstrate use of multiple and single type shop service manual.
- 03.02 Demonstrate use of specification handbooks and tune-up charts.
- 03.03 Demonstrate use of manufacturer parts catalogs.
- 03.04 Demonstrate use of microfiche.
- 03.05 Demonstrate use of marine engine installation manuals.
- 03.06 Demonstrate use of flat rate and service bulletins.

04.0 PERFORM BASIC WELDING SKILLS--The student will be able to:

- 04.01 Set up and operate gas and electric various welding equipment.
- 04.02 Burn (cut) material using mechanized or hand-held gas torch equipment.
- 04.03 Prepare metal surfaces for welding.
- 04.04 Identify type of metal to be welded.

04.05 Braze metal frames and structures.
04.06 Fabricate metal frames and structures.
04.07 Pressure test weldment.
04.08 Perform plug weld technique.
04.09 Gas weld ferrous metals in all positions with or without filler rod.
04.10 Perform TIG welding in aluminum and stainless steel.
04.11 Use and maintenance of TIG welding equipment.
04.12 Perform MIG type welding on various metals.
04.13 Use welding principles to heat and remove broken screws and bolts.

05.0 REMOVE AND INSTALL ENGINES--The student will be able to:

05.01 Disconnect engine, mounts, wiring, and lines.
05.02 Operate hydraulic engine hoist.
05.03 Mount engine mounts, wiring and lines.
05.04 Reconnect engine mounts, wiring and lines.
05.05 Cut openings for different engine installations.
05.06 Mount jet drive type of engine.
05.07 Align inboard (gas & diesel) engines to manufacturers specifications.
05.08 Mount and align stern drive to housing using manufacturers special tools and manuals.

06.0 RECONDITION AND SERVICE ENGINES--The student will be able to:

06.01 Remove and replace powerhead.
06.02 Disassemble engine.
06.03 Clean engine parts for inspection.
06.04 Inspect and check for proper condition.
06.05 Remove and replace oil pump.
06.06 Remove and replace fuel pump.
06.07 Service a multi-piece crankshaft.
06.08 Replace connecting rods and bearings.
06.09 Grind valves and time valves.
06.10 Inspect and grind powerhead.
06.11 Remove and replace flywheel.
06.12 Remove and replace exhaust manifolds.
06.13 Perform cylinder compression test.
06.14 Perform engine tune-up.
06.15 Perform operational inspection of engine lubrication system.
06.16 Remove and service piston ring and pistons.
06.17 Fit piston pins.
06.18 Inspect crankshaft, camshaft, connecting rods and piston assembly.
06.19 Torque powerhead and lower unit to specifications.
06.20 Hone cylinders to manufacturers specifications.

07.0 PERFORM DIAGNOSIS SERVICE AND REPAIRS FOR ALL TYPES OF MARINE IGNITION SYSTEMS--The student will be able to:

07.01 Diagnose, repair and replace malfunctions of ignition system components.
07.02 Set ignition timing.
07.03 Inspect secondary circuit lead wires, distributor and rotor measure resistance in secondary wires.
07.04 Inspect points, and condensors of the the primary circuit.
07.05 Overhaul distributors.
07.06 Analyze or adjust engine performance using engine analyzer devices.
07.07 Remove and replace spark plugs.
07.08 Adjust armature air gap.
07.09 Time the ignition system for O/B engines.
07.10 Use specialized test equipment.
07.11 Test CD type ignition systems.
07.12 Describe differences between marine and automotive type ignition components.
07.13 Observe safety practices in marine applications.
07.14 Read and interpret manufacturers wire diagrams.
07.15 Operate an engine dynometer.

08.0 DEVELOP SKILLS IN ELECTRICAL-ELECTRONIC THEORY OF OPERATION AND APPLICATION--The student will be able to:

08.01 Apply Ohm's Law to series circuit.
08.02 Apply Ohm's Law to parallel circuits.
08.03 Apply Ohm's Law to series-parallel circuits.
08.04 Perform continuity test.
08.05 Diagnose and repair alternator.
08.06 Diagnose and repair or replace charging system regulator.
08.07 Service or replace battery cables and battery box.
08.08 Diagnose, repair or replace starter.
08.09 Diagnose and repair malfunctions in the cranking system.
08.10 Perform operational inspection of lighting system.
08.11 Measure voltage drops, current flow, resistance in a circuit or component with a multimeter.
08.12 Repair or replace switches to include ignition switches.
08.13 Repair or replace fuse block assembly.
08.14 Locate and repair shorts and open circuits in wiring.
08.15 Inspect and test windshield wiper motor, blades and arms.
08.16 Inspect or replace rectifier.
08.17 Replace diode assembly.
08.18 Remove, replace and repair electrical remote control assembly.
08.19 Service and install diesel and gasoline marine alarm systems.

09.0 TROUBLESHOOT AND REPAIR FUEL SYSTEMS--The student will be able to:

09.01 Identify fuel system components.
09.02 Explain operation of fuel system and components.
09.03 Repair carburetion.
09.04 Repair gasoline injection systems.
09.05 Replace fuel system components.
09.06 Identify fuel systems malfunction.
09.07 Replace fuel filter.
09.08 Repair fuel lines.
09.09 Adjust carburetor.
09.10 Service automatic or manual choke.
09.11 Service fuel pump.
09.12 Analyze for foreign particles in fuel system.
09.13 Correct fuel tank installation.
09.14 Test engines fuel flow using manufacturers procedures and test equipment.
09.15 Identify fuel and oil specification for outboard motors, four-cycle engines and diesel applications.
09.16 Repair and test diesel fuel injector-nozzles.
09.17 Repair and test diesel fuel pumps.
09.18 Replace and adjust unit type injector or marine diesel engines.
09.19 Correct procedure and timing of fuel injector pumps.
09.20 Conduct diesel fuel pressure test.
09.21 Correct rack adjustment on diesel engines.

10.0 SERVICE COOLING SYSTEMS--The student will be able to:

10.01 Check engine temperature.
10.02 Test thermostat.
10.03 Inspect and/or replace water pump.
10.04 Inspect and/or replace circulating water pump.
10.05 Pressure test cooling system.
10.06 Remove, clean, and replace water cooling parts.
10.07 Inspect-repair heat exchanges on gasoline and marine diesel engine.
10.08 Correct installation and inspection/testing of marine keel coolers.
10.09 Identify different types of approved coolant used in marine closed cooling systems.
10.10 Check engine block cooling passages for corrosion and build-up.

11.0 SERVICE EXHAUST SYSTEMS--The student will be able to:

11.01 Remove, inspect and replace an exhaust housing.
11.02 Remove, inspect and replace inner exhaust housing.

11.03 Remove, inspect and replace seal.
11.04 Remove, inspect and replace aft exhaust cover.
11.05 Remove, inspect and replace rubber mount.
11.06 Remove, inspect and replace clamp.
11.07 Remove, inspect and replace mount cover.
11.08 Remove, inspect and replace water tube.
11.09 Inspect service turbo charger.
11.10 Recommend correct exhaust tubing for different marine applications.
11.11 Service marine water cooled exhaust systems.
11.12 Determine back pressure by under water exhaust applications.

12.0 DEMONSTRATE SHOP MANAGEMENT FUNCTIONS--The student will be able to:

12.01 Process work orders.
12.02 Process merchandise return.
12.03 Select shop equipment and materials.
12.04 Supervise employees.
12.05 Develop work schedules.
12.06 Process warranty claims.
12.07 Perform business and computational skills.
12.08 Use inventory card files and select parts from stock.
12.09 Sell marine merchandise.
12.10 Process sales and service receipts.
12.11 Operate computer for inventory control.
12.12 Operate computer for service orders.
12.13 Program computers for new marine parts/merchandise received.
12.14 Place marine merchandise into correct/orderly inventory.
12.15 Complete correct order forms and perform both by computer program and written process.

13.0 IDENTIFY SPECIAL MARINE PRINCIPLES--The student will be able to:

13.01 Explain basic principles of thrust in marine applications.
13.02 Explain basic principles of propulsion in marine applications.
13.03 Explain correct propeller selection and performance.
13.04 Identify types of hulls used in marine applications.
13.05 Explain speed-length-ratio and calculate hull, speed, and engine selection
13.06 Identify bow angle and its effect on performance.
13.07 Perform dynometer test on different engine horsepowers.
13.08 Perform test tank operations using manufacturers test wheels.
13.09 Perform sea trials.
13.10 Identify transom heights and explain the effects on engine performance/speed/horsepower.

14.0 REPAIR INBOARD DRIVE SYSTEMS--The student will be able to:

14.01 Inspect gear housing assembly.
14.02 Determine fluid levels.
14.03 Adjust gear linkages.
14.04 Torque mounting bolts.
14.05 Inspect vacuum shift controls.
14.06 Inspect drive shaft.
14.07 Lubricate universal joint.
14.08 Inspect gimbal bearing.
14.09 Inspect contant velocity joint.
14.10 Measure driveshaft angle and runout.
14.11 Replace power transmission system.
14.12 Rebuild power transmission.
14.13 Correctly apply manufacturers procedures in shiming and adjusting operations.

15.0 RIG BOATS--The student will be able to:

15.01 Install engine steering components by mechanical and hydraulic.
15.02 Install and service electrical wiring harness.
15.03 Install and adjust trim tabs on outboard and stern drives, both mechanical and hydraulic type.

15.04 Idenify sea drive installation.
15.05 List methods of outboard motor transom bracket installation.
15.06 Describe and illustrate correct lighting/wiring procedures.
15.07 Install engine remote control by manufacturers specifications.

16.0 REPAIR LOWER UNITS--The student will be able to:

16.01 Lubricate lower unit.
16.02 Pressure and vacuum test lower unit.
16.03 Lubricate transom steering busing, cables, etc.
16.04 Inspect, clean and lubricate propeller shaft.
16.05 Inspect and install propeller.
16.06 Remove and replace magnets in lower unit.
16.07 Inspect, remove and replace vertical drive gear.
16.08 Remove, inspect and replace clutch dog.
16.09 Remove, inspect and replace clutch coils.
16.10 Remove, inspect and replace drive shaft pinion.
16.11 Remove, inspect and replace drive components.
16.12 Remove, inspect and replace lower unit seals.
16.13 Remove and replace swivel bracket.
16.14 Remove, inspect and replace forward and reverse driving gears.
16.15 Remove, inspect and replace drive shaft and components.
16.16 Remove, inspect and replace hydraulic pump, shaft rod end plunger.
16.17 Adjust trim tab.
16.18 Inspect and replace U-joints.
16.19 Inspect and repair or replace lower unit lock.
16.20 Remove, replace and repair tilt assemblies to include hydraulic tilt.
16.21 Correctly shim lower units to engine manufacturer's specifications.
16.22 Disassemble/reassemble stern drive gear cases.
16.23 Disassemble/inspect/service/reassemble inboard marine transmissions both gasoline and diesel.
16.24 Demonstrate the ability to analyze and solve problems, to do necessary research and to report the results in good form.
16.25 Develop individual responsibility for work done in the lab.
16.26 Develop an understanding and skill in testing and diagnosing marine engine service problems and to develop appreciation of the true value of testing equipment.
16.27 Calculate torque and gear ratio.
16.28 Compare and identify all types of gear arrangements.
16.29 Explain operation theory of mechanical shifting, electric shifting, and hydroelectric shifting.
16.30 Identify the major parts of these shifting mechanisms.
16.31 Understand by examination the principles of marine propulsion propeller theory.
16.32 Demonstrate an understanding of engine installation.
16.33 Apply knowledge to disassembly and assembly of all marine transmissions.
16.34 Handle lifting devices properly.
16.35 Diagnose plantery gear principle of operation and theory.

17.0 PERFORM CORROSION EXPERIMENTS AND UNDERSTAND CORROSION CONTROL--The student will be able to:

17.01 Identify galvanic corrosion.
17.02 Explain the use and function of the galvanic series.
17.03 Understand corrosion and its prevention.
17.04 List chemical equation and symbols.
17.05 Demonstrate a basic knowledge of electricity.
17.06 Identify maintenance of boat hulls and when to determine its time.
17.07 Identify difference in corrosion and cavitation.
17.08 Demonstrate by lab experiments cause of corrosion.
17.09 List in test form, actual lab reports in the field.
17.10 Distinguish fatigue corrosion.
17.11 Understand electrolysis and its causes of corrosion.
17.12 Correctly prepare metals for protective coatings.
17.13 Identify protective coatings.
17.14 Practice safe lab experiences with dangerous chemicals.
17.15 Demonstrate theory of operation of impress currents.

17.16 Show proper installation procedure of impress current unit on board ship.
17.17 Maintain records and diagnose impress current failure.
17.18 Write report analysis on corrosion in our environment.
17.19 Identify non-metalic corrosion.
17.20 Define special tools used in the maintenance and testing of sacrificial anodes.
17.21 Understand acrylic and styrene copolymer coating.
17.22 List causes of stray current corrosion.

18.0 FIBERGLASS THEORY, BOAT BUILDING, AND MAINTENANCE--The student will be able to:

18.01 Understand safe handling and care of fiberglass resins and materials.
18.02 Apply mixture methods of resins, coal tars, gel coat, and paints.
18.03 Prepare the student in fiberglass boat manufacturing concepts.
18.04 Prepare to cast a model, finishing of a mold.
18.05 Installation procedures of decks and gunwall.
18.06 Successfully repair damanged fibergalss hulls into serviceable condition.
18.07 Learn modern methods of maintaining new and old hull in order to extend the life of a fiberglass boat.
18.08 Demonstrate advance methods of boat building and the manufacturing of fiberglass accessories.

19.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

19.01 Conduct a job search.
19.02 Secure information about a job.
19.03 Identify documents which may be required when applying for a job interview.
19.04 Complete a job application form correctly.
19.05 Demonstrate competence in job interview techniques.
19.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other employees.
19.07 Identify and adopt acceptable work habits.
19.08 Demonstrate knowledge of how to take job changes appropriately.
19.09 Demonstrate acceptable employee health habits.

20.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

20.01 Define entrepreneurship.
20.02 Describe the importance of entrepreneurship to the American economy.
20.03 List the advantages and disadvantages of business ownership.
20.04 Identify the risks involved in ownership of a business.
20.05 Identify the necessary personal characteristics of a successful entrepreneur.
20.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK — PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION — EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Masonry

CODE NUMBER: Secondary ________ Postsecondary BCT0400

Florida CIP IN46.010200

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ________

APPLICABLE LEVEL(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 13-17

CERTIFICATION COVERAGE: TEC CONSTR @ 7 TROWEL TR 7 BLDG CONST @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as bricklayers (861.381-018), stone masons (861.381-038), Bricklayer Helpers (861.381-022), as a Construction Worker I (869.664-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, blueprint reading and specifications, related mathematics, properties and characteristics of brick, trade terms, and construction of masonry buildings and building components.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in use and care of tools and bricklaying equipment, preparation of mortar, bonding methods, and laying brick and block to construct buildings and building components at a rate compatible with industry standards.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 contact hours (2160 clock hours).

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in performing basic masonry skills.
02. Demonstrate proficiency in using materials and mortar properly.
03. Demonstrate proficiency in performing construction practices/techniques to industry standards.
04. Demonstrate proficiency in constructing brick/masonry walls.

05. Demonstrate proficiency in performing construction details.
06. Demonstrate proficiency in performing cleaning operations.
07. Demonstrate productivity skills
08. Demonstrate employability skills
09. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS   EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education   SECONDARY NUMBER: ________

PROGRAM TITLE: Masonry   POSTSECONDARY NUMBER: BCT0400

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING BASIC MASONRY SKILLS--The student will be able to:

01.01 **Complete Industry Orientation**
01.02 Trace the history of the Masonry Industry
01.03 Explain the importance of the construction industry to the local, state, and national economy
01.04 Identify available employment opportunities
01.05 Explain three factors involved in good workmanship
01.06 **Understand and Comply with Safety Rules and Regulations**
01.07 List personal safety rules
01.08 List general job safety rules
01.09 Demonstrate the correct way to lift heavy objects
01.10 Explain the purpose of the OSHA act
01.11 Qualify in applied basic first-aid procedure
01.12 **Demonstrate Applied Math Skills**
01.13 Calculate area and volume problems
01.14 Estimate materials needed for a specific job
01.15 Solve estimating problems
01.16 Solve basic ratio and proportion problems
01.17 **Identify and Use Hand Tools**
01.18 Identify hand tools
01.19 Distinguish between modular rule and brick spacing rule
01.20 List factors to consider when selecting a brick trowel
01.21 List basic rules concerning care of hand tools
01.22 List basic rules concerning safe use of hand tools
01.23 Demonstrate the proper use of hand tools
01.24 **Identify and Use Power Tools**
01.25 Identify power tools
01.26 List safety rules for operating a masonry saw
01.27 Cut masonry units using a table saw with an abrasive blade
01.28 Cut masonry units using a table saw with a diamond blade
01.29 Set up and operate power tools safely
01.30 **Differentiate Between and Read Blueprints**
01.31 Identify types of drawings
01.32 Identify symbols
01.33 List items found in a set of masonry symbols
01.34 List items on a detail drawing
01.35 Demonstrate the ability to use an architect's scale by scaling a drawing
01.36 Explain the difference between a plan view, an elevation, and a section on blueprints
01.37 Interpret a set of specifications
01.38 Demonstrate the ability to read and interpret simple blueprints
01.39 Interpret a finish schedule
01.40 Read and interpret local building codes and national standards
01.41 **Weld and Cut Metals (Optional in the program, but a Masonry graduate needs to possess these skills)**
01.42 Identify the parts of an oxyacetylene cutting outfit
01.43 Identify types of oxyacetylene cutting flames
01.44 List reasons for poor cuts
01.45 List reasons for backfires
01.46 Arrange, in order, steps to follow in case of flashbacks
01.47 Set up equipment for oxyacetylene cutting
01.48 Turn on, light, adjust to a neutral flame, and turn off oxyacetylene cutting equipment
01.49 Make a 90° cut in mild steel and restart a cut
01.50 Cut round stock
01.51 List types of arc welders
01.52 List types of electrodes
01.53 List sizes of electrodes
01.54 List factors to consider when selecting electrodes
01.55 Identify the steps of the welding process
01.56 Identify the kinds of welds
01.57 Identify the types of weld joints
01.58 List safety precautions pertaining to welding
01.59 Demonstrate the ability to use two methods to strike an arc
01.60 Start, stop, and restart a bead

01.61 Construct a pad weld
01.62 Construct a butt weld

02.0 DEMONSTRATE PROFICIENCY IN USING MATERIALS AND MORTAR PROPERLY --The student will be able to:

02.01 **Identify and State the Uses of Materials**
02.02 Identify 5 types of clay/brick used in the local area
02.03 Identify 5 types of Concrete Masonry Units (CMU) used in the local area
02.04 Identify 5 types of natural stone used in the local area
02.05 Identify concrete precast units (i.e., sills and lintels)
02.06 Identify masonry accessories used in the local area (i.e., wall ties, and wall reinforcement)
02.07 Label the parts of a brick
02.08 Distinguish between modular and nonmodular brick
02.09 Identify brick positioning in a wall
02.10 Identify shapes of concrete masonry units
02.11 List kinds of sills and lintels
02.12 List types of cut stone
02.13 List principal uses of refractory brick
02.14 Identify types of kilns used in brick manufacturing
02.15 Identify steps used in brick manufacturing
02.16 Describe procedures used to manufacture concrete block
02.17 **Identify Different Mortars and Grouts**
02.18 Identify mortar by components (aggregate, cementacious materials, and additives
02.19 Identify types of mortar (M, N, S, and O) and proportioning
02.20 Identify colored mortars (admix and factory blended)
02.21 Identify types and purposes of grouts for reinforced to nonreinforced masonry

03.0 DEMONSTRATE PROFICIENCY IN PERFORMING CONSTRUCTION PRACTICES/TECHNIQUES TO INDUSTRY STANDARDS--The student will be able to:

03.01 **Lay Out Structures**
03.02 Identify methods of layout
03.03 Identify types of bonds
03.04 Identify load-bearing and nonload-bearing walls
03.05 List types of reinforced masonry
03.06 Identify types of through-wall bonding
03.07 Identify types of flashing
03.08 Identify types of leads
03.09 Identify types of tooling
03.10 Establish building layouts
03.11 Use a transit to establish level
03.12 Erect batter boards and locate building lines
03.13 Square boarding using the 6-8-10 rule
03.14 Make a story pole
03.15 Identify measuring tools
03.16 List uses of modular and spacing rules
03.17 Identify symbols and abbreviations
03.18 List items found in a set of masonry symbols
03.19 List items on a detail drawing
03.20 Scale a drawing using an architect's scale
03.21 Read and interpret a simple blueprint
03.22 Interpret a finish schedule
03.23 Identify types of levels
03.24 Identify types of self-reading rods
03.25 List common errors contributing to incorrect measurements
03.26 Identify hand motions used by an instrument person
03.27 Read a self-reading rod
03.28 Set up and adjust a builder's level
03.29 **Lay Foundations**
03.30 Lay out footings
03.31 Place rebar
03.32 Place and rough finish concrete
03.33 Lay out and establish grades for foundations
03.34 Establish corners and lay out concrete block according to a specific bonding plan
03.35 Lay foundation walls to joist and brick shelf height
03.36 Waterproof foundation walls

03.37 Install flashing, anchor bolts, termite shields, and weep holes
03.38 **Mix and Blend Mortars and Brick**
03.39 Identify tools and equipment used for mixing mortar
03.40 List factors affecting the consistency of mortar
03.41 List common ratios of mortar mixtures
03.42 Mix types of mortar (M, N, S, and O) mechanically and by hand
03.43 Retemper mortar
03.44 Mix tuck-pointing mortar
03.45 Blend brick according to the color range
03.46 **Spread Mortar and Lay Brick and Block**
03.47 Demonstrate the correct way to hold a trowel
03.48 Demonstrate the ability to manipulate a trowel
03.49 Select the proper trowel for laying brick
03.50 Demonstrate the cupping method of picking up mortar for brick
03.51 Identify methods of picking up mortar from the mortar board
03.52 Identify the direction of travel when placing mortar while laying brick
03.53 Identify types of bedding
03.54 Demonstrate the pick and dip method for laying brick
03.55 Demonstrate the method for spreading mortar for brick
03.56 Demonstrate different styles of cross-head joints
03.57 Spread mortar on a 2 x 2 for brick
03.58 Identify methods of putting up the line
03.59 Lay brick to the line with established leads
03.60 Build a 90° brick lead
03.61 Select the proper trowel for laying block
03.62 Demonstrate the method for picking up mortar for block
03.63 Demonstrate the method for face-shell spreading of mortar for block
03.64 Spread mortar on a 2 x 4 for block
03.65 Lay block to the line with established leads
03.66 Build a 90° block lead
03.67 **Lay Out the Bond**
03.68 Lay out the first two courses for bonding
03.69 Lay out using English cross bond
03.70 Lay out using Flemish cross bond
03.71 Lay out using Dutch cross bond
03.72 Lay out using 1/3 bond
03.73 Lay out using stack bond
03.74 Lay out using running bond
03.75 Lay out using common bond
03.76 Demonstrate the ability to lay brick in soldier position
03.77 Demonstrate the ability to lay brick in header position
03.78 Demonstrate the ability to lay brick in rowlock position
03.79 Demonstrate the ability to lay brick in sailor position
03.80 **Identify and Install Different Types of Flashing**
03.81 Identify types of flashing
03.82 Install a base through wall cavity wall flashing
03.83 Install brick veneer base flashing
03.84 Install flashing in reglet
03.85 Install flashing for sills and heads of openings
03.86 **Identify and Install Wall Reinforcments and Ties**
03.87 Identify four types of joint reinforcement used locally
03.88 Install truss or ladder-wall reinforcing
03.89 Install dovetail anchors, adjustable wall ties, and corrugated veneer ties
03.90 Identify methods of layout
03.91 Identify types of bonds
03.92 Identify load-bearing and nonload-bearing walls
03.93 List types of reinforced masonry
03.94 List factors to consider when building a cavity wall
03.95 Identify types of through-wall bonding
03.96 List types of reinforcement
03.97 **Tool and Point Joints and Walls**
03.98 Tool concave joints
03.99 Tool rake joints
03.100 Tool weather joints
03.101 Tool V-jointer joints
03.102 Tool grapevine joints
03.103 Tool stuck joints
03.104 Cut/rough joints
03.105 Tuck-point a wall

03.106 Brush and touch-up a wall
03.107 Erect and Inspect Scaffolding
03.108 Erect and inspect scaffolding in accordance with OSHA standards

04.0 DEMONSTRATE PROFICIENCY IN CONSTRUCTING BRICK/MASONRY WALLS --The student will be able to:

04.01 Set up the job
04.02 Arrange masonry materials for efficient use
04.03 Place mortar pans properly
04.04 Temper or shake-up mortar with the proper shovels
04.05 Lay out the structure
04.06 Lay out the bond
04.07 Establish corners and leads
04.08 Pull the line
04.09 Lay the specified masonry materials to job plan

05.0 DEMONSTRATE PROFICIENCY IN PERFORMING CONSTRUCTION DETAILS--The student will be able to:

05.01 Identify 5 types of arches (flat, jack, Gothic, semi-circle, Corinthian)
05.02 List purposes of arches
05.03 Identify types of paving
05.04 Identify types of paving patterns
05.05 List purposes of masonry paving
05.06 Identify types of precast panels
05.07 List purposes of grouting
05.08 Construct paving using a given plan
05.09 Construct a column using a given plan
05.10 Construct a pier using a given plan
05.11 Lay out and construct arches from given plans
05.12 Identify types of fireplaces
05.13 List factors to consider when constructing fireplaces and chimneys
05.14 List characteristics of firebrick
05.15 Distinguish between firebrick mortar and brick mortar
05.16 Demonstrate the ability to butter firebrick
05.17 Construct a firebox
05.18 Construct a fireplace
05.19 Identify components of fireplaces and chimneys
05.20 Lay out and construct a fireplace and chimney to given plans
05.21 Lay out a wall section using glass block or other new local materials

06.0 DEMONSTRATE PROFICIENCY IN PERFORMING CLEANING OPERATIONS--The student will be able to:

06.01 List reasons for cleaning
06.02 Identify cleaning equipment
06.03 List types of cleaning material
06.04 Identify pointing tools
06.05 Point new work
06.06 Point old work
06.07 List reasons for caulking
06.08 Match types of calking to specific uses
06.09 Identify caulking tools
06.10 Caulk expansion joints
06.11 List safety precautions to follow when cleaning
06.12 Identify 5 methods of wall cleaning
06.13 Prepare cleaning solutions
06.14 Prepare the wall
06.15 Wash the wall

7.0 DEMONSTRATE PRODUCTIVITY SKILLS--The student will be able to:

07.01 Lay Brick to Given Productivity Levels (Student will be rated at one or more levels)
07.02 Lay standard 8" brick--jointed on one side--on straight brick veneer wall--with established leads--at an average daily rate of 100-200

07.03 Lay standard 8" brick--jointed on one side--on straight brick veneer wall--with established leads--at an average daily rate of 200-300
07.04 Lay standard 8" brick--jointed on one side--on straight brick veneer wall--with established leads--at an average daily rate of 300-400
07.05 Lay standard 8" brick--jointed on one side--on straight brick veneer wall--with established leads--at an average daily rate of 400-500
07.06 Lay standard 8" brick--jointed on one side--on straight brick veneer wall--with established leads--at an average daily rate of 500-600
07.07 Lay standard 8" brick--jointed on one side--on straight brick veneer wall--with established leads--at an average daily rate of 600-700
07.08 Lay standard 8" brick--jointed on one side--on straight brick veneer wall--with established leads--at an average daily rate of 700-800
07.09 Lay standard 8" brick--jointed on one side--on straight brick veneer wall--with established leads--at an average daily rate of over 800
07.10 **Lay Block to Given Productivity Levels (Student will be rated at one or more levels)**
07.11 Lay 8" x 8" x 16" block--jointed on one side--on a straight block wall--with established leads--at an average daily rate of 50-100
07.12 Lay 8" x 8" x 16" block--jointed on one side--on a straight block wall--with established leads--at an average daily rate of 100-150
07.13 Lay 8" x 8" x 16" block--jointed on one side--on a straight block wall--with established leads--at an average daily rate of 150-200
07.14 Lay 8" x 8" x 16" block--jointed on one side--on a straight block wall--with established leads--at an average daily rate of 200-250
07.15 Lay 8" x 8" x 16" block--jointed on one side--on a straight block wall--with established leads--at an average daily rate of 250-300
07.16 Lay 8" x 8" x 16" block--jointed on one side--on a straight block wall--with established leads--at an average daily rate of 300-350
07.17 Lay 8" x 8" x 16" block--jointed on one side--on a straight block wall--with established leads--at an average daily rate of 350-400
07.18 Lay 8" x 8" x 16" block--jointed on one side--on a straight block wall--with established leads--at an average daily rate of over 400

08.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

08.01 Conduct a job search
08.02 Secure information about a job
08.03 Identify documents that may be required when applying for a job
08.04 Complete a job application form correctly
08.05 Demonstrate competence in job interview techniques
08.06 Identify or demonstrate appropriate responses to criticism from employer supervisor, or other persons
08.07 Identify acceptable work habits
08.08 Demonstrate knowledge of how to make job changes appropriately
08.09 Demonstrate acceptable employee health habits

09.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

09.01 Define entrepreneurship
09.02 Describe the importance of entrepreneurship to the American economy
09.03 List the advantages and disadvantages of business ownership
09.04 Identify the risks involved in ownership of a business
09.05 Identify the necessary personal characteristics of a successful entrepreneur
09.06 Identify the business skills needed to operate a small business efficiently and effectively

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Meat Cutting

CODE NUMBER: Secondary ______ Postsecondary HFT0192

Florida CIP IN48.040200

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-17

CERTIFICATION COVERAGE: MEAT CUTTE @ 7 QUAN FOOD 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as butchers and/or meat cutters (70041400), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and preparation of meats for food service establishments and the retail market.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in sanitation, use of tools and equipment, meat inspection and identification, and cutting, grinding, preservation, pricing, packaging, and weighing meat, poultry and seafood.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1080 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Operate power equipment, handtools, and sanitation procedures.
02. Prepare beef for retail display.
03. Prepare pork for retail display.
04. Prepare poultry for retail display.
05. Prepare variety meats (offals) for retail display.
06. Prepare custom cuts for special orders.
07. Demonstrate knowledge and skills of meat preservation, grinding, and retail packaging and pricing.
08. Prepare veal and baby beef for retail display.
09. Prepare lamb for retail display.
10. Prepare fish and seafood for retail display.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education — SECONDARY NUMBER: ________

PROGRAM TITLE: Meat Cutting — POSTSECONDARY NUMBER: HFT0192

01.0 OPERATE POWER EQUIPMENT, HANDTOOLS, AND SANITATION PROCEDURES--The student will be able to:

01.01 Identify, use, clean, and maintain scales.
01.02 Identify, use, clean, and maintain slicing machine.
01.03 Identify, use, clean, and maintain meat tenderizers.
01.04 Identify, use, clean, and maintain meat grinders.
01.05 Identify, use, clean, and maintain meat saws.
01.06 Identify, use, clean, and maintain knives.
01.07 Identify, use, clean, and maintain oilstones.
01.08 Identify, use, clean, and maintain display cases.
01.09 Clean and sanitize concrete surfaces.
01.10 Clean and sanitize glass surfaces.
01.11 Clean and sanitize metal surfaces.
01.12 Clean and sanitize porcelain surfaces.
01.13 Clean and sanitize tile surfaces.
01.14 Clean and sanitize wood surfaces.

02.0 PREPARE BEEF FOR RETAIL DISPLAY--The student will be able to:

02.01 Bone beef.
02.02 Break beef forequarter and hindquarter.
02.03 Cube beef by machine.
02.04 Cut and prepare beef brains.
02.05 Cut and prepare beef heart.
02.06 Cut and prepare beef liver.
02.07 Cut and prepare beef tongue.
02.08 Slice beef brisket.
02.09 Cut whole beef brisket, bone in.
02.10 Debone whole beef brisket.
02.11 Cut beef carcass into wholesale cuts.
02.12 Cut beef chuck.
02.13 Cut beef flank.
02.14 Cut beef foreshank.
02.15 Cut beef kidneys.
02.16 Cut standing rib roast.
02.17 Cut rib steaks.
02.18 Cut full beef round.
02.19 Cut beef round.
02.20 Cut heel of round.
02.21 Cut hind shank.
02.22 Cut porterhouse steak.
02.23 Cut porterhouse roast.
02.24 Cut beef short plate.
02.25 Cut wedge bone sirloin steak.
02.26 Cut flat bone sirloin steak.
02.27 Cut pin bone sirloin steaks.
02.28 Cut beef sweet breads.
02.29 Cut boneless tip roast.
02.30 Cut tip steaks.
02.31 Cut beef tripe.
02.32 Cut ox tails.
02.33 Pull beef tenderloin (filet).
02.34 Shape beef roasts with string.
02.35 Strip the loin.
02.36 Tenderize beef chemically.
02.37 Tenderize beef by machine.
02.38 Make ground beef.
02.39 Cut special cuts.
02.40 Make new cuts.
02.41 Describe various beef items to customers.
02.42 Label beef in the display case.
02.43 Receive customer orders by telephone.
02.44 Re-wrap packages for self-service display case.
02.45 Rotate beef in display cases.
02.46 Set up self-service beef display.
02.47 Stock self-service beef displays.
02.48 Wrap beef for customers' home freezers.
02.49 Wrap packages for self-service display cases.

03.0 PREPARE PORK FOR RETAIL DISPLAY--The student will be able to:

03.01 Bone pork.
03.02 Cut and prepare pork brains.
03.03 Cut bacon (side pork).
03.04 Cut blade bones.
03.05 Cut boston shoulder.
03.06 Cut breast bones.
03.07 Cut carcass into wholesale pork cuts.
03.08 Cut clear plate.
03.09 Cut cracklings.
03.10 Cut fat back.
03.11 Cut jowl.
03.12 Cut leaf fat.
03.13 Cut picnic shoulder.
03.14 Cut pigs feet.
03.15 Cut pork cheeks.
03.16 Cut pork ears.
03.17 Cut pork fries.
03.18 Cut pork head.
03.19 Cut pork heart.
03.20 Cut pork kidney.
03.21 Cut pork lips.
03.22 Cut pork liver.
03.23 Cut pork loin.
03.24 Cut pork neckbones.
03.25 Cut pork skin.
03.26 Cut pork snouts.
03.27 Cut pork spareribs.
03.28 Cut pork tails.
03.29 Cut pork tongue.
03.30 Cut salt pork.
03.31 Cut smoked or fresh pork leg.
03.32 Shape pork roasts with string.
03.33 Slice ham electrically.
03.34 Slice ham manually.
03.35 Cut pork cutlets.
03.36 Tenderize pork.
03.37 Make boudin.
03.38 Make hog head cheese.
03.39 Make sausage.
03.40 Ground pork.
03.41 Hang and smoke prime.
03.42 Hang and smoke hams.
03.43 Hang and smoke bacon.
03.44 Hang and smoke neckbones.
03.45 Hang and smoke hocks.
03.46 Hang and smoke sausage.
03.47 Make smoked sausage.
03.48 Cut smoked slab bacon.
03.49 Check for different size cuts.
03.50 Check for different size packages.
03.51 Describe various pork items to customers.
03.52 Label pork in the display case.
03.53 Receive customer orders by telephone.
03.54 Re-wrap packages for self-service display case.
03.55 Rotate pork in display cases.
03.56 Set up self-service pork display.
03.57 Stock self-service pork display.
03.58 Wrap pork for customers' home freezers.
03.59 Wrap packages for self-service display cases.

04.0 PREPARE POULTRY FOR RETAIL DISPLAY--The student will be able to:

04.01 Shape a whole chicken.
04.02 Split a chicken.
04.03 Quarter a chicken.
04.04 Remove and fold wings.
04.05 Remove and display thighs and drumsticks.
04.06 Bone a thigh.
04.07 Separate the back from the breast.
04.08 Prepare necks for display.
04.09 Prepare giblets for display.
04.10 Prepare a tray pack for a complete chicken.

05.0 PREPARE VARIETY MEATS (OFFALS) FOR RETAIL DISPLAY--The student will be able to:

05.01 Identify various variety meats for the customer.
05.02 Label variety meats in the display case.
05.03 Arrange a variety meat display.
05.04 Wrap variety meats for self-service display.

06.0 PREPARE CUSTOM CUTS FOR SPECIAL ORDERS--The student will be able to:

06.01 Describe various meat items to the customer.
06.02 Demonstrate communication skills with the customer.
06.03 Receive special orders by telephone.
06.04 Wrap meats for customers home freezer.

07.0 DEMONSTRATE KNOWLEDGE AND SKILLS IN MEAT PRESERVATION, GRINDING, AND RETAIL PACKAGING AND PRICING--The student will be able to:

07.01 Demonstrate an understanding of how to control air circulation in storage areas.
07.02 Know how to control the temperature of a storage area.
07.03 Handle carcasses in the cooler.
07.04 Handle retail meat in the cooler.
07.05 Quick freeze meats.
07.06 Rotate meats in the storage area.
07.07 Determine the fineness or coarseness of the meat to be ground.
07.08 Select the proper grinding plate.
07.09 Inspect the meat for bone.
07.10 Properly and safely grind the meat.
07.11 Wrap the meat for self-service display.

08.0 PREPARE VEAL AND BABY BEEF FOR RETAIL DISPLAY--The student will be able to:

08.01 Bone veal.
08.02 Cut and prepare veal brains.
08.03 Cut calf fries.
08.04 Cut carcass into wholesale cuts of veal.
08.05 Cut veal breast.
08.06 Cut whole veal breast, bone in.
08.07 Debone whole veal breast.
08.08 Cut veal by machine.
08.09 Cut veal flank.
08.10 Cut veal heart.
08.11 Cut veal kidney.
08.12 Cut veal liver.
08.13 Cut veal loin.
08.14 Cut veal standing rib roast.
08.15 Cut veal rib steaks.
08.16 Cut full veal round.
08.17 Cut veal round.
08.18 Cut heel of round.
08.19 Cut veal shanks.
08.20 Cut veal shoulder.
08.21 Cut wedge bone sirloin steak.
08.22 Cut flat bone sirloin steaks.
08.23 Cut pin bone sirloin steaks.
08.24 Cut veal sweet breads.
08.25 Cut veal tongue.
08.26 Tenderize veal chemically.
08.27 Tenderize veal by machine.
08.28 Cut veal cutlets.
08.29 Grind veal.
08.30 Describe various veal items to customers.
08.31 Label veal in the display case.
08.32 Receive customer orders by telephone.
08.33 Re-wrap packages for self-service display case.
08.34 Rotate veal in display cases.
08.35 Set up self-service veal display.
08.36 Stock self-service veal display.
08.37 Wrap veal for customers' home freezers.
08.38 Wrap packages for self-service display cases.

09.0 PREPARE LAMB FOR RETAIL DISPLAY--The student will be able to:

09.01 Bone lamb.
09.02 Cube lamb.
09.03 Cut breast.
09.04 Cut carcass into warehouse cuts of lamb.
09.05 Cut lamb flank.
09.06 Cut lamb fries.
09.07 Cut lamb heart.
09.08 Cut lamb foreshank.
09.09 Cut lamb hindshank.
09.10 Cut lamb kidney.
09.11 Cut lamb liver.
09.12 Cut lamb loin.
09.13 Cut lamb neck.
09.14 Cut lamb rib.
09.15 Cut lamb shoulder.
09.16 Cut lamb sirloin.
09.17 Cut lamb tongue.
09.18 Cut leg of lamb.
09.19 Cut lamb short plate.
09.20 Grind lamb patties.
09.21 Cut special cuts.
09.22 Describe various lamb items to customers.
09.23 Label lamb in the display case.
09.24 Receive customer orders by telephone.
09.25 Re-wrap packages for self-service display case.
09.26 Rotate lamb in display cases.
09.27 Set up self-service lamb display.
09.28 Stock self-service lamb display.
09.29 Wrap lamb for customers' home freezers.
09.30 Wrap packages for self-service display cases.

10.0 PREPARE FISH AND SEAFOOD FOR RETAIL DISPLAY--The student will be able to:

10.01 Identify some of the more common varieties of finfish such as bass, grouper, flounder, macherel, mullet, snapper, croaker, trout, bluefish, shad, perch, salmon, tuna, eel, anchovy, catfish, cod, and haddock.
10.02 Identify some of the more common varieties of shellfish such as crabs, lobster, crawfish, shrimp, oysters, clams, scallops, abalone, conch, and squid.
10.03 Group shellfish as mullusks or crustaceans.
10.04 Identify various species of shrimp.
10.05 Identify various species of crab.
10.06 Identify various species of lobster.
10.07 Identify the gills, pelvic fins, pectoral fin, anal fin, and dorsal fin of a fish.
10.08 Gill and gut a fish.
10.09 Scale a fish.
10.10 Skin a fish.
10.11 Fillet a fish and steak a fish.
10.12 Explain the causes for deterioration of seafood.
10.13 Inspect and receive (or reject) a seafood shipment from a supplier.
10.14 Inspect the fill area, eyes, and belly cavity of a finfish for evidence of bacteria growth.
10.15 Demonstrate the ability to monitor proper temperature control when receiving, storing, and displaying seafood.
10.16 Prepare detailed records of seafood received, stored, disposed of, and sold.
10.17 Manage a self-service seafood department.
10.18 Frequently monitor display case temperature.
10.19 Rotate products for shortest shelf life.
10.20 Identify and use special seafood wrapping materials.
10.21 Group the seafood by taste, species, and availability.
10.22 Manage a full service seafood department.
10.23 Sanitize a seafood display case.
10.24 Prepare a wet pan for displaying seafood.
10.25 Prepare an attractive wet pan seafood display.
10.26 Prepare and monitor a full seafood display case.
10.27 Prepare a product removal report (dump sheet).
10.28 Manage a frozen seafood display.
10.29 Monitor temperature at -10°F or lower.
10.30 Inspect packaging materials for good general condition and tight fit.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

- 11.01 Conduct a job search.
- 11.02 Secure information about a job.
- 11.03 Identify documents which may be required when applying for a job interview.
- 11.04 Complete a job application form correctly.
- 11.05 Demonstrate competence in job interview techniques.
- 11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
- 11.07 Identify acceptable work habits.
- 11.08 Demonstrate knowledge of how to make job changes appropriately.
- 11.09 Demonstrate acceptable employee health habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

- 12.01 Define entrepreneurship.
- 12.02 Describe the importance of entrepreneurship to the American economy.
- 12.03 List the advantages and disadvantages of business ownership.
- 12.04 Identify the risks involved in ownership of a business.
- 12.05 Identify the necessary personal characteristics of a successful entrepreneur.
- 12.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Mechanical Design Technology

CODE NUMBER: Secondary ______ Postsecondary ETM0590

Florida CIP IN15.080500

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-15

CERTIFICATION COVERAGE: TEC MECH @ 7 TEC CONSTR @ 7 BLDG CONST @ 7
TEC DRAFT @ 7 DRAFTING 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as mechanical equipment engineering assistants (007.161-018), mechanical engineering technicians (007.161-026), mechanical drafters (007.281-010), tool designers (007.061-026), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and skills necessary to assist mechanical-design or equipment-systems engineers in designing, detailing, producing, and testing machines using using appropriate available materials, processes, techniques, and facilities.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in drafting, manufacturing and fabrication procedures, machine design, material testing, quality control, mechanics, and technical reporting.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of orientation information.
02. Apply basic drafting skills.
03. Solve technical mathematical problems.
04. Prepare multi-view drawings.
05. Prepare sectional views.
06. Prepare auxiliary drawings.
07. Apply basic dimensioning.
08. Prepare pictorial drawings.
09. Prepare surface developments.

10. Utilize drafting applications.
11. Prepare basic charts and graphs.
12. Prepare computer-aided drawings.
13. Prepare basic architectural drawings.
14. Prepare basic structural details.
15. Prepare basic map drawings.
16. Prepare basic civil drawings.
17. Prepare basic electrical/electronic drawings.
18. Prepare basic pneumatic/hydraulic drawings.
19. Prepare mechanical drawings.
20. Prepare sheet metal drawings.
21. Demonstrate understanding of applied physics and mechanics.
22. Solve mathematical problems.
23. Demonstrate understanding of strength of material.
24. Read, analyze, interpret and write technical reports.
25. Demonstrate understanding of quality control procedures.
26. Demonstrate understanding of manufacturing/fabricating processes.
27. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS

MECHANICAL DESIGN TECHNOLOGY

01.0 DEMONSTRATE KNOWLEDGE OF ORIENTATION INFORMATION — The student will be able to:

01.01 Apply school policies and procedures.
01.02 Demonstrate personal safety.
01.03 Demonstrate procedures for diaster situations.
01.04 Apply fire safety rules and procedures.
01.05 Identify various drafting instruments equipment and aids.

02.0 APPLY BASIC DRAFTING SKILLS — The student will be able to:

02.01 Set up a drafting machine and drafting equipment.
02.02 Construct borders, information blocks, and center drawings.
02.03 Construct freehand sketches.
02.04 Read and transfer measurements.
02.05 Letter freehand (letters and numerals).
02.06 Draw intersections of lines and planes.
02.07 Letter with mechanical lettering devices and templates.
02.08 Construct a drawing with a pencil and a technical ink pen.
02.09 Apply established drafting standards.
02.10 Demonstrate correct use of tools and equipment.
02.11 Make error-free sketches.

03.0 SOLVE TECHNICAL MATHEMATICAL PROBLEMS — The student will be able to:

03.01 Solve arithmetic problems.
03.02 Solve algebra problems.
03.03 Solve trigonometry problems.
03.04 Solve geometry problems.
03.05 Solve surveying problems.

04.0 PREPARE MULTI-VIEW DRAWINGS — The student will be able to:

04.01 Select proper drawing scale, views and layouts.
04.02 Prepare drawings containing horizontal and vertical surfaces.
04.03 Prepare drawings containing circles and/or arcs.
04.04 Prepare drawings containing incline surface(s).
04.05 Prepare drawings incorporating partial views.
04.06 Prepare drawings incorporating removed details and conventional breaks.

05.0 PREPARE SECTIONAL VIEWS — The student will be able to:

05.01 Prepare drawings containing full sections and half sections.
05.02 Prepare drawings containing offset sections.
05.03 Prepare drawings containing revolved sections.
05.04 Prepare drawings containing removed sections and broken-out sections.
05.05 Develop conventional representation.

06.0 PREPARE AUXILIARY DRAWINGS — The student will be able to:

06.01 Prepare drawings containing primary auxiliary views.
06.02 Prepare drawings containing auxiliary views that include curved lines.
06.03 Prepare drawings containing auxiliary sections.
06.04 Prepare drawings containing secondary auxiliary views.

07.0 APPLY BASIC DIMENSIONING — The student will be able to:

07.01 Prepare drawings containing linear standard dimensions.
07.02 Prepare drawings that include angular standard dimensions.
07.03 Prepare drawings that include circular standard dimensions.
07.04 Prepare drawings using metric dimensions.
07.05 Prepare drawings using general and local notes.
07.06 Prepare drawings using surface characteristic notations.

08.0 PREPARE PICTORIAL DRAWINGS — The student will be able to:

08.01 Prepare isometric drawings.
08.02 Prepare diametric drawings.
08.03 Prepare cavalier drawings.

08.04 Prepare cabinet drawings.
08.05 Prepare one and two point perspectives.

09.0 PREPARE SURFACE DEVELOPMENTS — The student will be able to:

09.01 Prepare drawings with stretchouts of prisms, cylinders, cones, and pyramids.
09.02 Prepare stretchouts of a transition piece(s).

10.0 UTILIZE DRAFTING APPLICATIONS — The student will be able to:

10.01 Identify and use the various drafting and graphic appliques.
10.02 Perform cut and paste techniques.
10.03 Identify and use photo techniques.
10.04 Prepare overlay drawings.
10.05 Make drawing changes on a sepia.
10.06 Apply inking techniques.

11.0 PREPARE BASIC CHARTS AND GRAPHS — The student will be able to:

11.01 Prepare bar, pie, and flow charts.
11.02 Prepare rectangular and semi-logarithmic graphs.

12.0 PREPARE COMPUTERS AIDED DRAWINGS — The student will be able to:

12.01 Operate alpha-numeric keyboards (keyboarding).
12.02 Operate graphic terminals.
12.03 Operate plotters.
12.04 Operate digitizers.
12.05 Operate paper tape punches.
12.06 Operate magnetic tape drives.
12.07 Operate printers.
12.08 Analyze and communicate equipment failures.
12.09 Generate isometric views.
12.10 Generate assemblies, details, and schematics.
12.11 Apply notes and special instructions.
12.12 Manipulate views.
12.13 Apply scaling.
12.14 Apply dimensioning.
12.15 Develop three-dimensional drawings.
12.16 Select appropriate line work.
12.17 Generate layouts.

13.0 PREPARE BASIC ARCHITECTURAL DRAWINGS — The student will be able to:

13.01 Construct architectural symbols.
13.02 Produce representative architectural drawings.
13.03 Prepare bill of materials.
13.04 Read and interpret applicable local/state federal codes.

14.0 PREPARE BASIC STRUCTURAL DETAILS — The student will be able to:

14.01 Draw structural steel shapes.
14.02 Dimension a structural steel drawing.
14.03 Draw a beam connection.
14.04 Construct a column detail drawing.
14.05 Construct detail truss drawings in steel and timber.
14.06 Prepare foundation and slab plan.
14.07 Prepare floor framing plan.
14.08 Prepare a roofing framing plan.
14.09 Draw section and details.
14.10 Draw a concrete foundation plan.

15.0 PREPARE BASIC MAP DRAWINGS — The student will be able to:

15.01 Prepare traverse drawings.
15.02 Prepare plat drawings.
15.03 Prepare street layout drawings.
15.04 Prepare map drawings.

16.0 PREPARE BASIC CIVIL DRAWINGS — The student will be able to:

16.01 Plot profiles.
16.02 Prepare plan and profile drawings.
16.03 Prepare detail cross-sections for roads, airports, and water/sewage systems.
16.04 Plot field notes.
16.05 Lay out drawings.
16.06 Prepare contour map.
16.07 Prepare cover sheets.

17.0 PREPARE BASIC ELECTRICAL/ELECTRONIC DRAWINGS — The student will be able to:

17.01 Prepare schematic drawings.
17.02 Prepare printed circuit board drawings.
17.03 Prepare package drawings.
17.04 Prepare connection drawings.
17.05 Prepare interconnection drawings.
17.06 Prepare wiring lists.
17.07 Prepare cable drawings.
17.08 Prepare harness drawings.
17.09 Prepare component drawings.
17.10 Prepare logic diagrams.

18.0 PREPARE BASIC PNEUMATIC/HYDRAULIC DRAWINGS — The student will be able to:

18.01 Prepare piping drawings.
18.02 Prepare pump and motor drawings.
18.03 Prepare cylinder and piston diagrams.
18.04 Prepare valve drawings.
18.05 Prepare pump section drawings.
18.06 Prepare pulley and chain drive drawings.

19.0 PREPARE MECHANICAL DRAWINGS — The student will be able to:

19.01 Identify machine shop equipment (lathe, mill, punch, etc.) and interpret their applications.
19.02 Construct detail drawings of parts to be produced by various shop equipment.
19.03 Demonstrate functional application of tolerancing related to material used.
19.04 Demonstrate functional application of tolerancing related to method of production.
19.05 Demonstrate functional application of tolerancing related to interface with mating parts.
19.06 Construct an orthographic assembly/sub-assembly drawings.
19.07 Detail components of orthographic assembly/sub-assembly drawings.
19.08 Construct an isometric assembly/sub-assembly drawing.
19.09 Produce a parts list for an assembly drawing.
19.10 Construct a casting drawing.
19.11 Construct a jig drawing.
19.12 Construct a fixture drawing.
19.13 Construct a working drawing of a plate cam.
19.14 Choose materials to specification for given service considering corrosion effects (metal to metal, metal to environment, etc.) (marine).
19.15 Construct HVAC drawings and sizing (marine).
19.16 Calculate gear formulas.
19.17 Construct a working drawing of a spur gear.
19.18 Construct a sheet metal drawing showing development.
19.19 Construct an injection mold drawing.
19.20 Construct an isometric exploded view.
19.21 Construct a drawing specifically intended for use with C.N.C. machining.
19.22 Construct individual component PC part drawings, including dimensioning and proper tolerancing, from a sketch of the composite machine.
19.23 Make a three-dimensional sketch of a component from its verbal description.
19.24 Show proper use of welding symbols.
19.25 Show proper use of surface finishes and symbols.
19.26 Demonstrate proper and reasonable use of tolerance on dimensions.
19.27 Construct a drawing which shows proper use of different types of fasteners.
19.28 Correct a drawing which lacks information.

20.0 PREPARE SHEET METAL DRAWINGS — The student will be able to:

20.01 Construct sheet metal symbols.
20.02 Produce representative sheet metal drawings.
20.03 Prepare bill of materials.
20.04 Read and interpret applicable local/state/federal codes.

21.0 DEMONSTRATE UNDERSTANDING OF APPLIED PHYSICS AND MECHANICS — The student will be able to:

21.01 Apply and solve vectors.
21.02 Solve force and motion problems.
21.03 Solve work, energy and power problems.
21.04 Solve friction problems.
21.05 Solve circular motion problems.
21.06 Solve rotational motion problems.
21.07 Solve problems involving the properities or solids.
21.08 Solve problems involving the properities of liquids.
21.09 Solve problems involving the properities of gases.
21.10 Solve temperature and heat problems.
21.11 Solve change-of-state problems.
21.12 Solve heat transfer problems.
21.13 Solve thermodynamic problems.
21.14 Solve problems with refrigeration and air conditioning.
21.15 Solve harmonic motion problems.
21.16 Solve sound wave problems.
21.17 Solve light problems.
21.18 Solve optical problems.
21.19 Solve electric circuit problems.
21.20 Solve electro-magnet problems.
21.21 Solve alternating current problems.
21.22 Solve problems about generators motors.
21.23 Solve electrostatic problems.
21.24 Solve magnetism problems.

22.0 SOLVE MATHEMATIC PROBLEMS

22.01 Solve arithmetic problems.
22.02 Solve algebra problems.
22.03 Solve trigonometry problems.
22.04 Solve surving problems.

23.0 DEMONSTRATE UNDERSTANDING OF STRENGTH OF MATERIAL — The student will be able to:

23.01 Solve equilibrium problems.
23.02 Solve stress and strain problems.
23.03 Solve centroid and inertia problems.
23.04 Solve connection/joint problems.
23.05 Solve problems with beam stresses.
23.06 Solve torsion problems.
23.07 Solve compression problems.
23.08 Solve tension problems.
23.09 Solve force combination problems.

24.0 READ, ANALYZE, INTERPRET, AND WRITE TECHNICAL REPORTS — The student will be able to:

24.01 Analyze content of technical report.
24.02 Prepare abstract of technical report.
24.03 Compose technical report.

25.0 DEMONSTRATE UNDERSTANDING OF QUALITY CONTROL PROCEDURES — The student will be able to:

25.01 Demonstrate and develop understanding of preset standards.
25.02 Match product to preset standards.
25.03 Evaluate product by preset characteristics.

26.0 DEMONSTRATE UNDERSTANDING OF MANUFACTURING/FABRICATION PROCESSES — The student will be able to:

26.01 Identify manufacturing/fabricating processes.

27.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS — The student will be able to:

27.01 List sources of job opening other than public or private employment agencies.
27.02 Write a letter of application for a job.
27.03 Prepare a vita, resume or personal fact sheet.
27.04 List factors to consider when applying for a job.

27.05 List ways of making contact with employers.
27.06 Identify documents which may be required when applying for a job interview.
27.07 Complete a job application form correctly.
27.08 Identify appropriate dress and grooming for a job interview.
27.09 Classify behaviors considered appropriate or inappropriate in a job interview situation.
27.10 Describe advantage to employerr and employees of being a productive worker.
27.11 Explain the purpose of supervision, self discipline and performance evaluation.
27.12 Identify appropriate response(s) to criticism from employer, supervisor or other employees.
27.13 List consequences of being absent frequently from the job.
27.14 List consequences of frequently arriving late for work.
27.15 List factors to consider when resigning from a job.
27.16 Write a letter of resignation.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Mechanical Drafting

CODE NUMBER: Secondary ______ Postsecondary ETD0700

Florida CIP IN48.010500

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-17

CERTIFICATION COVERAGE: DRAFTING 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as blueprint machine operators (979.682-014), drafter assistants (017.281-018), detailers (017.261-018), mechanical drafters (007.281-010), tool drafters (007.261-022), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the development of detailed working drawings and related specifications for mechanical devices and machinery including production drawings, jigs and fixtures, tools and dies, pnuematic/hydraulic applications and advanced computer aided drawings.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in drafting machines, office reproduction equipment, drafting tools, computer aided design systems, drafting track, technical publication and reference materials, and drafting materials/supplies common to industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of orientation information.
02. Apply basic drafting skills.
03. Solve technical mathematical problems.
04. Prepare multi-view drawings.
05. Prepare sectional views.
06. Prepare auxiliary drawings.
07. Apply basic dimensioning.
08. Prepare pictorial drawings.
09. Prepare surface developments.
10. Utilize drafting applications.

11. Prepare basic charts and graphs.
12. Prepare basic computer aided drawings.
13. Prepare basic architectural drawings.
14. Prepare basic structural details.
15. Prepare basic map drawings.
16. Prepare basic civil drawings.
17. Prepare basic electrical/electronic drawings.
18. Prepare basic pneumatic/hydraulic drawings.
19. Prepare computer aided drawings.
20. Prepare advance mechanical drawings.
21. Prepare production drawings.
22. Prepare tool drawings.
23. Demonstrate employability skills.
24. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial SECONDARY NUMBER:

PROGRAM TITLE: Mechanical Drafting POSTSECONDARY NUMBER: ETD0700

01.0 DEMONSTRATE KNOWLEDGE OF ORIENTATION INFORMATION--The student will be able to:

01.01 Identify school, classroom and grading policies.
01.02 Apply safety practices.
01.03 Identify drafting careers and occupational concepts.
01.04 Identify course overview.
01.05 Locate resource materials and audio-visual training equipment.
01.06 Use reproduction equipment i.e., blueprint machines and office copy equipment.

02.0 APPLY BASIC DRAFTING SKILLS--The student will be able to:

02.01 Use drafting equipment, measuring scales, drawing media, drafting instruments and consumable materials.
02.02 Use conversion tables for fractions, decimals and metric measurements.
02.03 Identify the use of the alphabet of lines.
02.04 Prepare title blocks and other drafting formats.
02.05 Use various freehand and other lettering techniques.
02.06 Apply geometric, oblique and prospective sketches.
02.07 Prepare axonometric, oblique and prospective sketches.
02.08 Interpret reports and specifications.

03.0 SOLVE TECHNICAL MATHEMATICAL PROBLEMS--The student will be able to:

03.01 Solve arithmetic problems.
03.02 Solve algebra problems.
03.03 Solve trigonometric problems.
03.04 Solve geometry problems.
03.05 Apply multiple discipline calculations.

04.0 PREPARE MULTI-VIEW DRAWINGS--The student will be able to:

04.01 Select proper drawing scale, views and layout.
04.02 Prepare drawings containing horizontal and vertical surfaces.
04.03 Prepare drawings containing circles and/or arcs.
04.04 Prepare drawings containing incline surfaces.
04.05 Prepare drawings incorporating partial views.
04.06 Prepare drawings incorporating removed details and conventional breaks.

05.0 PREPARE SECTIONAL VIEWS--The student will be able to:

05.01 Prepare drawings containing full sections and half sections.
05.02 Prepare drawings containing offset sections.
05.03 Prepare drawings containing revolved sections.
05.04 Prepare drawings containing removed sections and broken-out sections.
05.05 Use conventional representation.
05.06 Prepare a sectional-assembly drawing applying material symbols.

06.0 PREPARE AUXILIARY DRAWINGS--The student will be able to:

06.01 Prepare drawings containing primary auxiliary views.
06.02 Prepare drawings containing auxiliary views that include curved lines.
06.03 Prepare drawings containing auxiliary sections.
06.04 Prepare drawings containing secondary auxiliary view.

07.0 APPLY BASIC DIMENSIONING--The student will be able to:

07.01 Prepare drawings containing linear standard dimensions.
07.02 Prepare drawings that include angular standard dimensions.
07.03 Prepare drawings include circular standard dimensions.
07.04 Prepare drawings using metric dimensions.
07.05 Prepare drawings using general and local notes.
07.06 Prepare drawings using surface characteristic notations.

08.0 PREPARE PICTORIAL DRAWINGS--The student will be able to:

08.01 Prepare isometric drawings.
08.02 Prepare dimetric drawings.
08.03 Prepare cavalier drawings.
08.04 Prepare cabinet drawings.
08.05 Prepare one and two point perspectives.

09.0 PREPARE SURFACE DEVELOPMENTS--The student will be able to:

09.01 Prepare drawings with sketchouts of prisms, cylinders, cones and pyramids.
09.02 Prepare sketchouts of a transition piece.
09.03 Prepare drawings involving intersecting pieces.

10.0 UTILIZE DRAFTING APPLICATIONS--The student will be able to:

10.01 Identify and use the various drafting and graphic appliques.
10.02 Use cut and paste techniques.
10.03 Identify and use photo techniques.
10.04 Prepare overlay drawings.
10.05 Make drawing changes on a sepia.
10.06 Apply inking techniques.

11.0 PREPARE BASIC CHARTS AND GRAPHS--The student will be able to:

11.01 Prepare bar, pie, and flow charts.
11.02 Prepare rectangular and semi-logarithmic graphs.

12.0 PREPARE BASIC COMPUTER AIDED DRAWINGS--The student will be able to:

12.01 Use full size standard keyboard.
12.02 Use dual disc drive console.
12.03 Use monitor.
12.04 Use digitizer.
12.05 Use plotter (single and multipen).
12.06 Format, transfer and operate diskette.
12.07 Produce multi-view drawings with dimensions.
12.08 Produce section view drawings with dimensions.
12.09 Produce auxiliary view drawings with dimensions.
12.10 Produce pictorial drawings.
12.11 Produce charts and graphs.

13.0 PREPARE BASIC ARCHITECTURAL DRAWINGS--The student will be able to:

13.01 Interpret vendors' catalogs and technical tables.
13.02 Prepare floor plan drawings, with dimensions.
13.03 Prepare foundation plan and detail drawings, with dimensions.
13.04 Prepare elevation drawings with dimensions.
13.05 Prepare sections with dimensions.
13.06 Prepare schedules.
13.07 Prepare landscape layouts.

14.0 PREPARE BASIC STRUCTURAL DETAILS--The student will be able to:

14.01 Interpret structural steel and reinforcing concrete manuals and technical tables.
14.02 Draw structural steel beam connections.
14.03 Draw reinforcing bar details.

15.0 PREPARE BASIC MAP DRAWINGS--The student will be able to:

15.01 Prepare traverse drawings.
15.02 Prepare plat drawings.
15.03 Prepare street layout drawings.
15.04 Prepare map drawings.

16.0 PREPARE BASIC CIVIL DRAWINGS--The student will be able to:

16.01 Prepare topographic drawings.
16.02 Prepare drainage drawings.
16.03 Prepare highway drawings.

17.0 PREPARE BASIC ELECTRICAL/ELECTRONIC DRAWINGS--The student will be able to:

17.01 Prepare schematic drawings.
17.02 Prepare printed circuit board drawings.
17.03 Prepare package drawings.

18.0 PREPARE BASIC PNEUMATIC/HYDRAULIC DRAWINGS--The student will be able to:

18.01 Prepare piping drawings.
18.02 Prepare pictorial drawings.
18.03 Prepare cutaway diagrams.
18.04 Prepare graphical diagrams.
18.05 Prepare combination diagrams.

19.0 PREPARE ADVANCE COMPUTER AIDED DRAWINGS--The student will be able to:

19.01 Produce architectural drawings.
19.02 Produce structural steel and reinforcing detail drawings.
19.03 Produce map drawings.
19.04 Produce civil drawings.
19.05 Produce electrical/electronic drawings.
19.06 Produce pneumatic/hydraulic drawings.
19.07 Produce detail drawings.
19.08 Produce pattern shop detail drawings.
19.09 Produce casting drawings.
19.10 Produce forging detail drawings.
19.11 Produce machining detail drawings.
19.12 Produce stamping drawings.
19.13 Produce welding drawings.
19.14 Produce assembly drawings.
19.15 Produce installation drawings.

20.0 PREPARE ADVANCE MECHANICAL DRAWINGS--The student will be able to:

20.01 Resolve problems by descriptive geometry and revolutions.
20.02 Prepare advance surface drawings.
20.03 Identify the various manufacturing methods.
20.04 Use precision dimensioning to include geometric characters.
20.05 Make engineering changes on drawings.
20.06 Prepare fastener drawings.
20.07 Prepare cam drawings.
20.08 Prepare gear drawings.
20.09 Prepare spring drawings.
20.10 Prepare pneumatic/hydraulic drawings.

21.0 PREPARE PRODUCTION DRAWINGS--The student will be able to:

21.01 Make a design layout drawing.
21.02 Make detail drawings.
21.03 Make pattern shop detail drawings.
21.04 Make casting drawings.
21.05 Make forging detail drawings.
21.06 Make machining detail drawings.
21.07 Make stamping drawings.
21.08 Make welding drawings.
21.09 Make assembly drawings.
21.10 Prepare installation drawings.

22.0 PREPARE TOOL DRAWINGS--The student will be able to:

22.01 Design jigs and fixtures.
22.02 Design cutting dies.
22.03 Design forming dies.

23.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

23.01 Conduct a job search.
23.02 Secure information about a job.
23.03 Identify documents which may be required when applying for a job interview.
23.04 Complete a job application form correctly.
23.05 Demonstrate competence in job interview techniques.
23.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
23.07 Identify acceptable work habits.
23.08 Demonstrate knowledge of how to make job changes appropriately.
23.09 Demonstrate acceptable employee health habits.

24.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

24.01 Define entrepreneurship.
24.02 Describe the importance of entrepreneurship to the American economy.
24.03 List the advantages and disadvantages of business ownership.
24.04 Identify the risks involved in ownership of a business.
24.05 Identify the necessary personal characteristics of a successful entrepreneur.
24.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Metal Fabrication

CODE NUMBER: Secondary 8754300 Postsecondary ______

Florida CIP IN48.051400

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

____ Postsecondary Vocational x Other 10-12, 21

CERTIFICATION COVERAGE: SHEET METAL 7 METAL WORK @ 7

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to prepare students for employment as metal fabricators-assemblers (809.281-010) sheetmetal workers (804.281-010), layout workers (600.281-018), cutoff saw operators (607.682-010), drill press operators (606.362-010), welders (819.384-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, measurement and layout, planning and design, sheetmetal work, structural steel, welding, mechanical fasteners, metal properties, heat treating, metalworking tools, and employability skills.

Listed below are the courses that comprise this program when offered at the secondary level:

8754310	Metal Fabrication 1
8754320	Metal Fabrication 2
8754330	Metal Fabrication 3
8754340	Metal Fabrication 4
8754350	Metal Fabrication 5
8754360	Metal Fabrication 6

II. **LABORATORY ACTIVITIES**: Shop or laboratory activities are an integral part of this program and provide instruction in safe work practices, measuring and layout tools, bench metal operations, electric metal bonding operations, gas welding and cutting operations, sheetmetal operations, grinding and sharpening tools, and metal working machines.

III. **SPECIAL NOTE**: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the students' individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate basic metal fabrication skills.
02. Demonstrate ability to read plans and drawings.
03. Use measuring and layout tools.
04. Describe metals and their properties.
05. Operate Metalworking machines.
06. Perform metal fabrication operations.
07. Perform gas welding and cutting operations.
08. Perform electric metal-bonding operations.
09. Demonstrate and practice employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS **EFFECTIVE DATE:** July, 1987

PROGRAM AREA: Industrial **SECONDARY NUMBER:** 8754300

PROGRAM TITLE: Metal Fabrication **POSTSECONDARY NUMBER:** ________

01.0 DEMONSTRATE BASIC METAL FABRICATION SKILLS--The student will be able to:

01.01 Comply with safety rules & practices.
01.02 Maintain a clean & orderly shop.
01.03 Make job-related decimal & fraction calculations
01.04 Solve job-related problems adding,subtracting, multiplying, & dividing numbers .
01.05 Solve job-related problems operating a hand-held calculator.
01.06 Solve job-related problems using mathematical handbooks, charts, & tables.
01.07 Use rulers & tape measures to measure work piece.
01.08 Compute feet, inches, and yards.
01.09 Use the ruler to measure objects to the nearest 1/32 inch.
01.10 Use the protractor to measure angles to nearest degree.
01.11 Use the protractor & triangles to draw angles.
01.12 Use a micrometer to measure to one thousandth of an inch.
01.13 Demonstrate proper use of material handling techniques.

02.0 DEMONSTRATE ABILITY TO READ PLANS AND DRAWINGS--The student will be able to:

02.01 Identify dimensions.
02.02 Identify lists of materials and specifications.
02.03 Identify section views/pictorial views.
02.04 Disassemble and assemble parts using an exploded view drawing.
02.05 Interpret blueprint.
02.06 Identify dimensioning of radii, round holes & chamfers.
02.07 Identify screw threads & bolt types.
02.08 Identify dimensional tolerances.
02.09 Identify metal fabrication symbols used in blueprints.

03.0 USE MEASURING AND LAYOUT TOOLS--The student will be able to:

03.01 Perform basic geometric construction.
03.02 Use marking gauges, center punches, scribes, surface gauges, squares, dividers, dial indicators, protractors, surfaceplates, depth gauges, circumference rules.
03.03 Develop patterns using parallel line, radial line and triangulation.
03.04 Make metal fabrication sketches.

04.0 DESCRIBE METALS AND THEIR PROPERTIES--The student will be able to:

04.01 Describe the steelmaking process.
04.02 Describe the differences between ferrous and nonferrous metals
04.03 Describe casting, alloys, forging.
04.04 Identify metals such as galvanized iron & steel, aluminum stainless steel, sheetmetal, copper, brass.
04.05 Identify properties of the most common metals.
04.06 Identify and describe common gauges, shapes, and dimensions of purchased materials.

05.0 OPERATE METALWORKING MACHINES--The student will be able to:

05.01 Identify the purpose of various types of machine shop equipment.
05.02 Identify types of a drill press.
05.03 Operate a drill press utilizing the correct drilling speed.
05.04 Operate a band saw utilizing the correct cutting speed.
05.05 Demonstrate clamping devices for securing stock for drilling.
05.06 Identify types and sizes of drill bits.
05.07 Use portable power saw equipment.
05.08 Use a cutoff or power hacksaw.
05.09 Use electric & air utility grinders.
05.10 Sharpen drill bits.
05.11 Select proper type of abrasive wheels for grinding machines.

06.0 PERFORM METAL FABRICATION OPERATIONS--The student will be able to:

06.01 Fabricate metal, edges, and seams.
06.02 Use hand tools to cut, punch, and shear metal.
06.03 Form sheetmetal using a brake, a folder, rools, and a turning machine.
06.04 Join metals using a solder, rivets, and mechanical fasteners.

07.0 PERFORM GAS WELDING AND CUTTING OPERATIONS--The student will be able to:

07.01 Identify welding cylinders, regulators, hoses, pressure gauges, and torches.
07.02 Describe welding equipment safety procedures.
07.03 Demonstrate proper flame settings.
07.04 Demonstrate basic gas welding skills.
07.05 Demonstrate procedures for adjusting and operating the oxyacetylene cutting torch.
07.06 Demonstrate freehand and guide cutting of various metal thicknesses.
07.07 Set up and operate a plasma arc cutting machine.

08.0 PERFORM ELECTRIC METAL-BONDING OPERATIONS--The student will be able to:

08.01 Describe and demonstrate the spot and arc welding process.
08.02 Demonstrate basic procedures for safely adjusting and operating an arc welder, selecting a rod, safety, striking and maintaining an arc, welding in various positions, and clamping.
08.03 Set-up and operate a spot welder.
08.04 Explain and demonstrate the MIG welding process.
08.05 Apply basic procedures for safely adjusting, operating, cleaning, and maintaining MIG welding equipment.
08.06 Apply basic procedures for safely adjusting and operating a TIG welder, welding in various position, selecting proper tips, and choosing filler metal.

09.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents that may be required when applying for a job.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS   EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial   COURSE CREDIT: 1

PROGRAM TITLE: Metal Fabrication   PROGRAM NUMBER: 8754300

COURSE TITLE: Metal Fabrication 1   COURSE NUMBER: 8754310

COURSE DESCRIPTION:

This course is designed to familiarize the student with facilities, safety and housekeeping rules. The student will also become familiar with materials and specifications, skilled in using measuring and layout tools, developing patterns,reading drawings, and making sketches.

01.0 DEMONSTRATE BASIC METAL FABRICATION SKILLS--The student will be able to:

01.01 Comply with safety rules & practices.
01.02 Maintain a clean & orderly shop.
01.03 Make job-related decimal & fraction calculations
01.04 Solve job-related problems adding,subtracting, multiplying, & dividing numbers .
01.05 Solve job-related problems operating a hand-held calculator.
01.06 Solve job-related problems using mathematical handbooks, charts, & tables.
01.07 Use rulers & tape measures to measure work piece.
01.08 Compute feet, inches, and yards.
01.09 Use the ruler to measure objects to the nearest 1/32 inch.
01.10 Use the protractor to measure angles to nearest degree.
01.11 Use the protractor & triangles to draw angles.
01.12 Use a micrometer to measure to one thousandth of an inch.
01.13 Demonstrate proper use of material handling techniques.

02.0 DEMONSTRATE ABILITY TO READ PLANS AND DRAWINGS--The student will be able to:

02.01 Identify dimensions.
02.02 Identify lists of materials and specifications.
02.03 Identify section views/pictorial views.
02.04 Disassemble and assemble parts using an exploded view drawing.
02.05 Interpret blueprint.
02.06 Identify dimensioning of radii, round holes & chamfers.
02.07 Identify screw threads & bolt types.
02.08 Identify dimensional tolerances.
02.09 Identify metal fabrication symbols used in blueprints.

03.0 USE MEASURING AND LAYOUT TOOLS--The student will be able to:

03.01 Perform basic geometric construction.
03.02 Use marking gauges, center punches, scribes, surface gauges, squares, dividers, dial indicators, protractors, surfaceplates, depth gauges, circumference rules.
03.03 Develop patterns using parallel line, radial line and triangulation.
03.04 Make metal fabrication sketches.

STUDENT PERFORMANCE STANDARDS   EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial   COURSE CREDIT: 1

PROGRAM TITLE: Metal Fabrication   PROGRAM NUMBER: 8754300

COURSE TITLE: Metal Fabrication 2   COURSE NUMBER: 8754320

COURSE DESCRIPTION:

This course is designed to familiarize the students with the steelmaking process and help them identify ferrous and nonferrous metals, castings, forgings, alloys, and the gauges, shapes, and dimensions of purchased materials. The student will also learn to identify, care for, and use metal working machines.

04.0 DESCRIBE METALS AND THEIR PROPERTIES--The student will be able to:

04.01 Describe the steelmaking process.
04.02 Describe the differences between ferrous and nonferrous metals
04.03 Describe casting, alloys, forging.
04.04 Identify metals such as galvanized iron & steel, aluminum stainless steel, sheetmetal, copper, brass.
04.05 Identify properties of the most common metals.
04.06 Identify and describe common gauges, shapes, and dimensions of purchased materials.

05.0 OPERATE METALWORKING MACHINES--The student will be able to:

05.01 Identify the purpose of various types of machine shop equipment.
05.02 Identify types of a drill press.
05.03 Operate a drill press utilizing the correct drilling speed.
05.04 Operate a band saw utilizing the correct cutting speed.
05.05 Demonstrate clamping devices for securing stock for drilling.
05.06 Identify types and sizes of drill bits.
05.07 Use portable power saw equipment.
05.08 Use a cutoff or power hacksaw.
05.09 Use electric & air utility grinders.
05.10 Sharpen drill bits.
05.11 Select proper type of abrasive wheels for grinding machines.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Metal Fabrication PROGRAM NUMBER: 8754300

COURSE TITLE: Metal Fabrication 3 COURSE NUMBER: 8754330

COURSE DESCRIPTION:

This course is designed to develop basic skills in basic metal fabrication operations.

06.0 PERFORM METAL FABRICATION OPERATIONS--The student will be able to:

06.01 Fabricate metal, edges, and seams.
06.02 Use hand tools to cut, punch, and shear metal.
06.03 Form sheetmetal using a brake, a folder, rools, and a turning machine.
06.04 Join metals using a solder, rivets, and mechanical fasteners.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Metal Fabrication PROGRAM NUMBER: 8754300

COURSE TITLE: Metal Fabrication 4 COURSE NUMBER: 8754340

COURSE DESCRIPTION:

This course is designed to develop skills in the safe use of gas welding and cutting equipment.

07.0 PERFORM GAS WELDING AND CUTTING OPERATIONS--The student will be able to:

- 07.01 Identify welding cylinders, regulators, hoses, pressure gauges, and torches.
- 07.02 Describe welding equipment safety procedures.
- 07.03 Demonstrate proper flame settings.
- 07.04 Demonstrate basic gas welding skills.
- 07.05 Demonstrate procedures for adjusting and operating the oxyacetylene cutting torch.
- 07.06 Demonstrate freehand and guide cutting of various metal thicknesses.
- 07.07 Set up and operate a plasma arc cutting machine.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Metal Fabrication — PROGRAM NUMBER: 8754300

COURSE TITLE: Metal Fabrication 5 — COURSE NUMBER: 8754350

COURSE DESCRIPTION:

This course is designed to develop skills in the safety and use of an arc welder and to familiarize the student with the basic procedures and the advantages of MIG and TIG welding.

08.0 PERFORM ELECTRIC METAL-BONDING OPERATIONS--The student will be able to:

- 08.01 Describe and demonstrate the spot and arc welding process.
- 08.02 Demonstrate basic procedures for safely adjusting and operating an arc welder, selecting a rod, safety, striking and maintaining an arc, welding in various positions, and clamping.
- 08.03 Set-up and operate a spot welder.
- 08.04 Explain and demonstrate the MIG welding process.
- 08.05 Apply basic procedures for safely adjusting, operating, cleaning, and maintaining MIG welding equipment.
- 08.06 Apply basic procedures for safely adjusting and operating a TIG welder, welding in various position, selecting proper tips, and choosing filler metal.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Metal Fabrication — PROGRAM NUMBER: 8754300

COURSE TITLE: Metal Fabrication 6 — COURSE NUMBER: 8754360

COURSE DESCRIPTION:

This course is designed to help the students demonstrate employability and entrepreneurship skills.

09.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS--The student will be able to:

- 09.01 Conduct a job search.
- 09.02 Secure information about a job.
- 09.03 Identify documents that may be required when applying for a job.
- 09.04 Complete a job application form correctly.
- 09.05 Demonstrate competence in job interview techniques.
- 09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
- 09.07 Identify acceptable work habits.

09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP: The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Micro Computer Electronics

CODE NUMBER: Secondary 8730200 Postsecondary ________

Florida CIP IN IN47.011400

SECONDARY SCHOOL CREDITS 8 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ________

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 10-12, 21

CERTIFICATION COVERAGE: COMP SVC 7 ELECTRONIC 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as micro computer electronics technician (003.161-014), computer service technician (003.161-014), electronics technician (003.161-014).

This program includes many of the competencies applicable to the common core of electronics program; these are noted with the designation (CE). The content includes, but is not not limited to communication skills; leadership skills; human relations and employability skills; safe and efficient work practices, and the installation, programming, operation maintenance, servicing, diagnosis, and correction of operational problems in computer systems arising from mechanical, electrical or electronics malfunctions.

Listed below are the courses that make up this program when offered at the secondary level.

8730210	Micro Computer Electronics 1
8730220	Micro Computer Electronics 2
8730230	Micro Computer Electronics 3
8730240	Micro Computer Electronics 4
8730250	Micro Computer Electronics 5
8730260	Micro Computer Electronics 6
8730270	Micro Computer Electronics 7
8730280	Micro Computer Electronics 8

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. The tools, test equipment, materials, consumer related equipment, and processes used in the laboratory are equal to those used in industry. Students will use the various types of precision test equipment found in general use throughout the electronics industry for the purpose of analyzing, troubleshooting and repairing computer circuitry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communications, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher, and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The common core of electronics competencies are identified with the designation (CE).

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the students' individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program the student will be able to:

01. Demonstrate proficiency in laboratory practices.
02. Demonstrate proficiency in DC circuits.
03. Demonstrate proficiency in AC circuits.
04. Demonstrate proficiency in solid-state devices
05. Demonstrate proficiency in analog circuits.
06. Demonstrate proficiency in digital devices.
07. Demonstrate proficiency in microprocessing.
08. Demonstrate proficiency in computer systems architecture.
09. Demonstrate proficiency software fundamentals.
10. Demonstrate an understanding of communication software.
11. Demonstrate an understanding of peripheral equipment.
12. Demonstrate an understanding of customer site requirements/ considerations.
13. Demonstrate an ability to perform technical recording and reporting.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Micro Computer Electronics PROGRAM NUMBER: 8730200

COURSE TITLE: Micro Computer Electronics 1 COURSE NUMBER: 8730210

COURSE DESCRIPTION:

This course is designed to provide instruction in laboratory practices, DC circuits and technical recording and reporting.

01.0 DEMONSTRATE PROFICIENCY IN LABORATORY PRACTICES (Note: Competencies 01.01 thru 01.07 apply to all subsequent categories and competency statements.)--The student will be able to:

01.01 Apply proper OSHA safety standards (CE).
01.02 Make electrical connections (CE).
01.03 Identify and use hand tools properly (CE).
01.04 Identify and use power tools properly (CE).
01.05 Demonstrate acceptable soldering and desoldering techniques (CE).
01.06 Apply basic keyboard skills.
01.07 Identify, write, and describe the purpose of technical reports.

02.0 DEMONSTRATE PROFICIENCY IN DC CIRCUITS--The student will be able to:

02.01 Solve algebraic problems to include exponentials (prerequisite to DC) (CE).
02.02 Relate electricity to the nature of matter (CE).
02.03 Identify sources of electricity (CE).
02.04 Define voltage, current, resistance, power, and energy (CE).
02.05 Apply and relate Ohm's law (CE).
02.06 Read and interpret color codes and symbols to identify electrical components and values (CE).
02.07 Measure properties of a circuit using VOM and DVM meters (CE).
02.08 Compute and measure conductance and resistance of conductors and insulators (CE).
02.09 Apply Ohm's law to series circuits (CE).
02.10 Construct and verify operation of series circuits (CE).
02.11 Troubleshoot series circuits (CE).
02.12 Apply Ohm's law to parallel circuits (CE).
02.13 Construct and verify the operation of parallel circuits (CE).
02.14 Troubleshoot parallel circuits (CE).
02.15 Apply Ohm's law to series-parallel circuits (CE).
02.16 Construct and verify the operation of series-parallel circuits (CE).
02.17 Troubleshoot series-parallel circuits (CE).
02.18 Identify and define voltage divider circuits (loaded and unloaded) (CE).
02.19 Construct and verify the operation of voltage divider circuits (loaded and unloaded) (CE).
02.20 Troubleshoot voltage divider circuits (loaded and unloaded) (CE).
02.21 Apply maximum power theory (CE).
02.22 Construct and verify the operation of DC circuits that demonstrate the maximum power transfer theory (CE).
02.23 Define magnetic properties of circuits and devices (CE).
02.24 Determine the physical and electrical characteristics of capacitors and inductors (CE).
02.25 Define RC and RL time constants and classify the output of differentiators and integrators (CE).
02.26 Construct and verify the operation of differentiators and integrators to determine RC and RL time constants (CE).
02.27 Troubleshoot differentiator and integrator circuits (CE).
02.28 Set up and operate a VOM for DC circuits (CE).
02.29 Set up and operate a DVM for DC circuits (CE).
02.30 Set up and operate power supplies for DC circuits (CE).
02.31 Set up and operate oscilloscopes for DC circuits (CE).

13.0 DEMONSTRATE AN ABILITY TO PERFORM TECHNICAL RECORDING AND REPORTING--The student will be able to:

13.01 Draw and interpret electronic schematics (CE).
13.02 Record data and design curves and graphs (CE).

13.03 Write reports and make oral presentations (CE).
13.04 Maintain test logs (CE).
13.05 Make equipment failure reports (CE).
13.06 Specify and requisition simple electronic components (CE).
13.07 Compose technical letters and memoranda (CE).
13.08 Write formal reports of laboratory experiences (CE).

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education — COURSE CREDIT: 1

PROGRAM TITLE: Micro Computer Electronics — PROGRAM NUMBER: 8730200

COURSE TITLE: Micro Computer Electronics 2 — COURSE NUMBER: 8730220

COURSE DESCRIPTION:

This course is designed to provide instruction in AC circuits and solid state devices.

03.0 DEMONSTRATE PROFICIENCY IN AC CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electronics (prerequisite to AC) (CE).
03.02 Identify properties of an AC signal (CE).
03.03 Identify AC sources (CE).
03.04 Analyze and measure AC signals using oscilloscope, frequency meter, and generator (CE).
03.05 Define the characteristics of AC capacitive circuits (CE).
03.06 Construct and verify the operation of AC capacitive circuits (CE).
03.07 Troubleshoot AC capacitive circuits (CE).
03.08 Define the characteristics of AC inductive circuits (CE).
03.09 Construct and verify the operation of AC inductive circuits (CE).
03.10 Troubleshoot AC inductive circuits (CE).
03.11 Define and apply the principles of transformers to AC circuits CE).
03.12 Construct and verify the operation of AC circuits utilizing transformers (CE).
03.13 Troubleshoot AC circuits utilizing transformers (CE).
03.14 Define the characteristics of RLC circuits (series, parallel, and complex) (CE).
03.15 Construct and verify the operation of RLC circuits (series, parallel, and complex) (CE).
03.16 Define the characteristics of series and parallel resonant circuits (CE).
03.17 Construct and verify the operation of series and parallel resonant circuits (CE).
03.18 Define the characteristics of filter circuits (CE).
03.19 Construct and verify the operation of filter circuits (CE).
03.20 Troubleshoot filter circuits (CE).
03.21 Define the characteristics of polyphase circuits (CE).
03.22 Define basic motor theory and operation (CE).
03.23 Define basic generator theory and operation (CE).
03.24 Set up and operate a VOM for AC circuits (CE).
03.25 Set up and operate a DVM for AC circuits (CE).
03.26 Set up and operate power supplies for AC circuits (CE).
03.27 Set up and operate oscilloscopes for AC circuits (CE).
03.28 Set up and operate frequency counters for AC circuits (CE).
03.29 Set up and operate signal generators for AC circuits (CE).
03.30 Set up and operate capacitor/inductor analyzers for AC circuits (CE).
03.31 Set up and operate impedance bridges for AC circuits (CE).

04.0 DEMONSTRATE PROFICIENCY IN SOLID-STATE DEVICES--The student will be able to:

04.01 Identify properties of semiconductor materials (CE).
04.02 Identify and define operating characteristics and applications of pn junction diodes (CE).

04.03 Identify and define operating characteristics and applications of special diodes (CE).
04.04 Analyze diode circuits (CE).
04.05 Construct diode circuits (CE).
04.06 Troubleshoot diode circuits (CE).
04.07 Identify and define operating characteristics and applications of bipolar transistors (CE).
04.08 Identify and define operating characteristics and applications of field effect transistors (FET's) (CE).
04.09 Identify and define operating characteristics and applications of thyristors (CE).
04.10 Identify and define operating characteristics and applications of integrated circuits (CE).
04.11 Set up and operate a VOM for solid-state devices (CE).
04.12 Set up and operate a DVM for solid-state devices (CE).
04.13 Set up and operate power supplies for solid-state devices (CE).
04.14 Set up and operate oscilloscopes for solid-state devices (CE).
04.15 Set up and operate frequency counters for solid-state devices (CE).
04.16 Set up and operate signal generators for solid-state devices (CE).
04.17 Set up and operate capacitor/inductor analyzers for solid-state devices (CE).
04.18 Set up and operate impedance bridges for solid-state devices (CE).
04.19 Set up and operate curve tracers (CE).
04.20 Set up and operate transistor testers (CE).

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1987
PROGRAM AREA:	Industrial Education	COURSE CREDIT:	1
PROGRAM TITLE:	Micro Computer Electronics	PROGRAM NUMBER:	8730200
COURSE TITLE:	Micro Computer Electronics 3	COURSE NUMBER:	8730230

COURSE DESCRIPTION:

This course is designed to provide instruction in analog circuits.

05.0 DEMONSTRATE PROFICIENCY IN ANALOG CIRCUITS--The student will be able to:

05.01 Identify and define operating characteristics and applications of single-stage amplifiers (CE).
05.02 Construct single-stage amplifiers (CE).
05.03 Troubleshoot single-stage amplifiers (CE).
05.04 Identify and define operational characteristics and applications of multistage amplifiers (CE).
05.05 Construct multistage amplifiers (CE).
05.06 Troubleshoot multistage amplifiers (CE).
05.07 Identify and define operating characteristics and applications of basic power supplies and filters (CE).
05.08 Construct basic power supplies and filters (CE).
05.09 Troubleshoot basic power supplies and filters (CE).
05.10 Identify and define operating characteristics and applications of differential and operational amplifiers (CE).
05.11 Construct differential and operational amplifiers (CE).
05.12 Troubleshoot differential and operational amplifiers (CE).
05.13 Identify and define operating characteristics and applications of power supply regulators (CE).
05.14 Construct power supply regulators (CE).
05.15 Troubleshoot power supply regulators (CE).
05.16 Identify and define operating characteristics and applications of active filters (CE).
05.17 Construct active filters (CE).
05.18 Troubleshoot active filters (CE).
05.19 Identify and define operating characteristics and applications of sinusoidal and non-sinusoidal oscillators (CE).

05.20 Construct oscillators (Optional in high school and vocational programs) (CE).
05.21 Troubleshoot oscillators (CE).
05.22 Identify and define operating characteristics and applications of motor phase-control circuits (single phase and multiphase) (CE).
05.23 Identify and define operating characteristics and applications of cathode ray tubes (CRT's) as used in video terminals (CE).
05.24 Identify and define operating characteristics and applications of optical devices (CE).
05.25 Set up and operate a VOM for analog circuits (CE).
05.26 Set up and operate a DVM for analog circuits (CE).
05.27 Set up and operate power supplies for analog circuits (CE).
05.28 Set up and operate oscilloscopes for analog circuits (CE).
05.29 Set up and operate frequency counters for analog circuits (CE).
05.30 Set up and operate signal generators for analog circuits (CE).
05.31 Set up and operate impedance bridges for analog circuits (CE).

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education COURSE CREDIT: 1

PROGRAM TITLE: Micro Computer Electronics PROGRAM NUMBER: 8730200

COURSE TITLE: Micro Computer Electronics 4 COURSE NUMBER: 8730240

COURSE DESCRIPTION:

This course is designed to provide instruction in digital devices.

06.0 DEMONSTRATE PROFICIENCY IN DIGITAL DEVICES--The student will be able to:

06.01 Define and apply numbering systems (hex., bin., and oct.)to codes and arithmetic (CE).
06.02 Analyze/minimize logic circuits using Boolean operations (CE).
06.03 Set up and operate a VOM for digital devices (CE).
06.04 Set up and operate a DVM for digital devices (CE).
06.05 Set up and operate logic probes for digital devices (CE).
06.06 Set up and operate power supplies for digital devices and solve power distribution and noise problems (CE).
06.07 Set up and operate pulsers for digital devices (CE).
06.08 Set up and operate oscilloscopes for digital devices (CE).
06.09 Set up and operate logic analyzers for digital devices (CE).
06.10 Set up and operate pulse generators for digital devices (CE).
06.11 Set up and operate counters for digital devices (CE).
06.12 Identify types of logic gates and their truth tables (CE).
06.13 Construct logic gates using discrete components (CE).
06.14 Troubleshoot logic gates (CE).
06.15 Identify and define types of flip-flops and their truth and excitation tables (CE).
06.16 Construct flip-flops using discrete components (CE).
06.17 Troubleshoot flip-flops (CE).
06.18 Identify, define, and measure characteristics of integrated-circuit (IC) logic families and electro-static sensitive devices(CE).
06.19 Identify types of registers and counters (CE).
06.20 Construct registers and counters using flip-flops (CE).
06.21 Troubleshoot registers and counters (CE).
06.22 Identify and define clock and timing circuits (CE).
06.23 Construct clock and timing circuits (CE).
06.24 Troubleshoot clock and timing circuits (CE).
06.25 Identify and relate types of logic circuits (CE).
06.26 Construct logic-arithmetic circuits (CE).
06.27 Troubleshoot logic-arithmetic circuits (CE).
06.28 Identify types of encoding and decoding devices (CE).
06.29 Construct encoders and decoders (CE).
06.30 Troubleshoot encoders and decoders (CE).
06.31 Identify multiplexer and demultiplexer circuits (CE)..
06.32 Construct multiplexer and demultiplexer circuits (CE).

06.33 Troubleshoot multiplexer and demultiplexer circuits (CE).
06.34 Identify types of memory circuits (static, dynamic, volatile, nonvolatile, and programmable devices, etc.) (CE).
06.35 Use memory devices in circuits (CE).
06.36 Troubleshoot memory-device circuits (CE).
06.37 Relate the uses of digital-to-analog and analog-to-digital conversions (CE).
06.38 Construct digital-to-analog and analog-to-digital circuits (CE).
06.39 Troubleshoot digital-to-analog and analog-to-digital circuits (CE).
06.40 Identify types of displays (LED, LCD, etc.) (CE).
06.41 Construct display circuits (CE).
06.42 Troubleshoot display circuits (CE).

STUDENT PERFORMANCE STANDARDS　EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education　COURSE CREDIT: 1

PROGRAM TITLE: Micro Computer Electronics　PROGRAM NUMBER: 8730200

COURSE TITLE: Micro Computer Electronics 5　COURSE NUMBER: 8730250

COURSE DESCRIPTION:

This course is designed to provide instruction in microprocessing and system architecture.

07.0 DEMONSTRATE PROFICIENCY IN MICROPROCESSING--The student will be able to:

07.01 Identify CPU (Architecture) building blocks and their uses (CE).
07.02 Analyze BUS concepts (CE).
07.03 Analyze various memory schemes (CE).
07.04 Set up and operate a VOM for microprocessing analysis (CE).
07.05 Set up and operate a DVM for microprocessing analysis (CE).
07.06 Set up and operate power supplies for microprocessor use (CE).
07.07 Set up and operate oscilloscopes for microprocessors (CE).
07.08 Set up and operate logic/data analyzers for microprocessor de-bug (CE).
07.09 Identify types of input and output devices and peripherals (PIA's, UART's, etc.) (CE).
07.10 Interface input and output ports (RS-232, RS-422, etc.) (CE).
07.11 Troubleshoot input and output ports (CE).
07.12 Execute computer instruction sets (CE).

08.0 DEMONSTRATE PROFICIENCY IN COMPUTER SYSTEMS ARCHITECTURE--The student will be able to:

08.01 Draw and explain systems configurations in block detail.
08.02 Interpret computer acronyms.
08.03 Identify and define priorities/interrupts at system level.
08.04 Define and list D.M.A. data handling systems (direct memory access).
08.05 Define functions of advanced memory techniques (virtual, pipeline, cache).
08.06 Troubleshoot a microcomputer system.

STUDENT PERFORMANCE STANDARDS　EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education　COURSE CREDIT: 1

PROGRAM TITLE: Micro Computer Electronics　PROGRAM NUMBER: 8730200

COURSE TITLE: Micro Computer Electronics 6　COURSE NUMBER: 8730260

COURSE DESCRIPTION:

This course is designed to provide instruction in software fundamentals and communication interfacing.

09.0 DEMONSTRATE PROFICIENCY IN SOFTWARE FUNDAMENTALS--The student will be able to:

09.01 Load and run operating system software.
09.02 Load and run diagnostic software.
09.03 Construct flow charts.
09.04 Analyze flow charts.
09.05 Identify and define computer languages and their uses.
09.06 Write a simple computer program in BASIC.
09.07 Write a computer program in assembly language.
09.08 Write a computer program in machine language.
09.09 Analyze firmware concepts.

10.0 DEMONSTRATE AN UNDERSTANDING OF COMMUNICATION INTERFACING--The student will be able to:

10.01 Identify and define EIA, IEEE, and CCITT standards.
10.02 Identify, define and analyze sync devices.
10.03 Identify, define and analyze async devices.
10.04 Identify and define networking levels or layers.
10.05 Identify and define protocols.
10.06 Identify and define packet switching.
10.07 Identify and define multi-user systems.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1987
PROGRAM AREA:	Industrial Education	COURSE CREDIT:	1
PROGRAM TITLE:	Micro Computer Electronics	PROGRAM NUMBER:	8730200
COURSE TITLE:	Micro Computer Electronics 7	COURSE NUMBER:	8730270

COURSE DESCRIPTION: This course is designed to provide instruction in peripheral equipment and customer site requirements.

11.0 DEMONSTRATE AN UNDERSTANDING OF PERIPHERAL EQUIPMENT--The student will be able to:

11.01 Identify types of card and papertape equipment and interface controllers.
11.02 Analyze and troubleshoot display terminals and interface controllers.
11.03 Analyze and troubleshoot printers and interface controllers.
11.04 Align printers and interface controllers.
11.05 Describe the operation of typical magnetic tape equipment and interface controllers.
11.06 Analyze disk equipment and interface controllers.
11.07 Troubleshoot and repair disk equipment and interface controllers.
11.08 Align disk equipment and interface controllers.
11.09 Define environmental requirements for peripherals/media.

12.0 DEMONSTRATE AN UNDERSTANDING OF CUSTOMER SITE REQUIREMENTS/CONSIDERATIONS --The student will be able to:

12.01 Apply effective relations.
12.02 Follow installation procedures.
12.03 Calculate/determine power requirements.
12.04 Calculate/determine environmental requirements.
12.05 List and perform PM techniques and requirements.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1987
PROGRAM AREA:	Industrial Education	COURSE CREDIT:	1
PROGRAM TITLE:	Micro Computer Electronics	PROGRAM NUMBER:	8730200
COURSE TITLE:	Micro Computer Electronics 8	COURSE NUMBER:	8730280

COURSE DESCRIPTION: This course is designed to provide instruction in employability skills and entrepreneurship.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents that may be required when applying for a job.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.
14.10 Write a resume.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

NOTE: (CE) designates common core of electronics competency.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Mine Safety and Health

CODE NUMBER: Secondary ______ Postsecondary ETI0701

Florida CIP IN15.079901

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ______7-9 ______9-12 ______Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13,15

CERTIFICATION COVERAGE: MSHA 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students to meet safety and health requirements for employment as miners working at surface mines and surface areas of underground mines as required by the Federal Mine Safety and Health Act of 1977 (Public Law 91-173 as amended by Public Law 95-164) or to provide updating and refresher training for persons previously or currently employed in these occupations as required by the Act.

The content includes, but is not limited to instruction in the statutory rights of miners, self-rescue and respiratory devices, mine conveyances and communications systems, introduction to the work environment, mandatory health and safety standards, escape and emergency evacuation plans, ground control, first aid, hazard recognition, and accident prevention.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and should include activities in the use, care, and maintenance of self-rescue and respiratory devices; use of mine communications systems, warning signals, and directional signs; visit and tour of mines; fire warning signals and firefighting procedures; hazard recognition and accident prevention procedures.

III. SPECIAL NOTE: The instruction in this program must be provided by instructors who, under Title 30 Code of Federal Regulations, Part 48, Subpart B, are Mine Safety and Health Administration approved instructors. The instructional content must be in accordance with the provisions of Public Law 91-173 as amended by Public Law 95-164; 30 CFR, Part 48, Subpart B; and training outlines provided by the Mine Safety and Health Administration.

Students required to receive mine safety and health training prior to employment at surface mines and surface areas of underground mines are classified as "miners" as defined in 30 CFR, Part 48, Subpart B, Section 48.22.

The length of this program, in accordance with the provisions of Public Law 91-173 as amended by Public law 95-164 and 30 CFR, Part 48, Subpart B will be a minimum of 24 hours for new miners and 8 hours of annual refresher training for all miners.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform employment obligations in accordance with the statutory rights of miners as defined in the Federal Mine Safety and Health Act of 1977 (Act) and Title 30 Code of Federal Regulations (30 CFR).
02. Use self-rescue and respiratory devices applicable to the employment.
03. Use the mine system of conveyances for miners and materials with safety and use the mine communication system for safety purposes.
04. Demonstrate knowledge of the working environment.
05. Use escape and emergency evacuation routes, recognize fire warning signals, and perform firefighting procedures.
06. Work safely in areas of highwalls, water hazards, pits and spoil banks

and practice safe work procedures during hours of darkness.

07. Demonstrate a knowledge of requirements for dust, noise and other health measurements.
08. Recognize and avoid generally hazardous conditions.
09. Recognize and avoid electrical hazards.
10. Recognize and avoid hazards related to explosives.
11. Observe health and safety aspects for assigned tasks.
12. Perform first aid measures.

PROGRAM AREA: Industrial SECONDARY NUMBER: ________

PROGRAM TITLE: Mine Safety and Health POSTSECONDARY NUMBER: ETI0701

01.0 Perform employment obligations in accordance with the statutory rights of miners as defined in the Federal Mine Safety and Health Act of 1977 (Act) and Title 30 Code of Federal Regulations (30 CFR) Part 48--The student will be able to:

01.01 State the purpose of the Act and 30 CFR Part 48.
01.02 Summarize the rights of miners with respect to safeguarding miner safety and health
01.03 Outline the authority and responsibility of the supervisor pertaining to safety and health practices.
01.04 Report accidents and hazards through proper channels.

02.0 Use self-rescue and respiratory devices applicable to the employment--The student will be able to:

02.01 Identify self-rescue devices appropriate to the situation.
02.02 Use self-rescue devices effectively.
02.03 Identify conditions warranting use of respiratory devices.
02.04 Identify the appropriate type of respiratory device for use under specific conditions.
02.05 Use the various types of respiratory devices properly and effectively.

03.0 Use mine conveyance systems safely and the mine communications system for safety purposes--The student will be able to:

03.01 Apply company, state, and federal rules with respect to the safe use of conveyance systems to transport personnel and materials.
03.02 Use the telephone system, warning system, and two-way radio as applicable to the employment situation.
03.03 Recognize and avoid the specific hazards of the work area as they pertain to haul roads, haulage equipment, pit area, blasting area, and plant area.
03.04 Recognize and observe both normal signs and emergency signs as appropriate.

04.0 Demonstrate knowledge of the work area--The student will be able to:

04.01 Identify the principal product, secondary product, and by-products produced by the employing company.
04.02 Identify the mining method used (i.e., single bench, multiple bench, dredging).
04.03 Identify the mining machinery used for drilling, excavating, and haulage and explain its general function and interrelationship with other mine functions.
04.04 Identify milling methods and machinery for crushing, sizing, separation, etc., and explain their general function and interrelationship with other mine functions.
04.05 Identify the methods of conveyance such as belt conveyors, screw conveyors, slurry, air, vehicle, rail, water conveyances and explain their general function and interrelationship with other mine functions.
04.06 Identify the hazardous areas, communications equipment, first aid supplies, firefighting equipment, and warning signs and devices of the work area.

05.0 Use escape and emergency evacuation routes, recognize firewarning signals, and perform firefighting procedures--The student will be able to:

05.01 Follow appropriate escape and emergency evacuation routes of the mine and/or plant.
05.02 Activate the emergency alarm system.
05.03 Recognize and/or activate the firewarning signal.
05.04 Select and use the appropriate type of fire extinguisher for specific types of fires.

06.0 Work safely in areas of highwalls, water hazards, pits and spoil banks and practice safe work procedures during hours of darkness--The student will be able to:

- 06.01 Recognize dangers in a highwall area and make needed corrections.
- 06.02 Recognize water hazards and take adequate precautions.
- 06.03 Recognize dangers in pit and spoil bank areas and make needed corrections.
- 06.04 Provide adequate illumination and practice safe work procedures during hours of darkness.

07.0 Demonstrate a knowledge of requirements for dust, noise, and other health measurements--The student will be able to:

- 07.01 Recognize common surface mine health hazards, including dust, noise, gases and fumes, and caustic, acid, and toxic chemicals.
- 07.02 Recognize conditions approaching the danger level and identify a need for sampling and measurement.
- 07.03 Take measures to protect self from injury.

08.0 Recognize and avoid generally hazardous conditions--The student will be able to:

- 08.01 Define hazards and accidents and recognize their causes.
- 08.02 Identify the hazards associated with each task pertaining to a particular job.
- 08.03 Make changes in the working environment, determine appropriate safety procedures, and select and use appropriate apparel and equipment to avoid or reduce the hazard.

09.0 Recognize and avoid electrical hazards--The student will be able to:

- 09.01 Recognize the effect of the human body coming in contact with electrical power.
- 09.02 Identify potential electrical hazards in the mine environment.
- 09.03 Rescue a worker from an electrical power source.

10.0 Recognize and avoid hazards related to explosives--The student will be able to:

- 10.01 Demonstrate a knowledge of permissable explosives for use at surface mines.
- 10.02 Demonstrate a knowledge of the types of hazards associated with explosives and their sources.

11.0 Observe health and safety aspects for assigned tasks--The student will be able to:

- 11.01 Analyze the health and safety aspects of the assigned task.
- 11.02 Perform the assigned task correctly, avoiding careless or thoughtless practices that will endanger health and safety.

12.0 Perform first aid measures--The student will be able to:

- 12.01 Perform artificial respiration.
- 12.02 Control bleeding.
- 12.03 Treat individuals for physical shock.
- 12.04 Provide initial treatment for wounds and burns.
- 12.05 Provide initial treatment for fractures and dislocations.
- 12.06 Transport an injured individual without compounding the injury.
- 12.07 Determine type of poisoning (ingestion, absorption, inhalation) and provide appropriate initial treatment.
- 12.08 Take initial action to treat victims of heart attack, stroke, heat exhaustion, or epileptic convulsions.

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Motorcycle Mechanics

CODE NUMBER: Secondary _______ Postsecondary MOM0990

Florida CIP IN47.060601

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-17

CERTIFICATION COVERAGE: GASENG RPR 7 MOTORCYCLE 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as motorcycle mechanics, motorcycle technicians (620.281-054), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, maintaining, troubleshooting, and repairing motorcycle engines and components.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in maintenance of frames and suspension, maintenance of wheels and brakes, maintenance of drive train, and maintenance and repair of engines.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1600 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Service, repair, troubleshoot/diagnose and overhaul frames and suspension.
02. Service, repair, troubleshoot/diagnose and overhaul wheels and brakes.
03. Service, repair, troubleshoot/diagnose and overhaul drive trains.
04. Service, repair, troubleshoot/diagnose and overhaul fuel and exhaust systems.
05. Service, repair, troubleshoot/diagnose and overhaul electrical systems.
06. Tune-up motorcycles.
07. Service, repair, troubleshoot/diagnose and overhaul engines.
08. Apply allied trades.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

PROGRAM AREA: Industrial   SECONDARY NUMBER: ________

PROGRAM TITLE: Motorcycle Mechanics   POSTSECONDARY NUMBER: MOM0990

01.0 SERVICE, REPAIR, TROUBLESHOOT/DIAGNOSE AND OVERHAUL FRAMES AND SUSPENSION--The student will be able to:

01.01 Service and overhaul front suspension.
01.02 Straighten fork tubes and triple clamps.
01.03 Service and overhaul rear suspension.
01.04 Remove and replace frames.

02.0 SERVICE, REPAIR, TROUBLESHOOT/DIAGNOSE AND OVERHAUL WHEELS AND BRAKES--The student will be able to:

02.01 Remove and replace hub.
02.02 Remove and remount tires.
02.03 Overhaul drum brakes.
02.04 Overhaul hydraulic brakes.

03.0 SERVICE, REPAIR, TROUBLESHOOT/DIAGNOSE AND OVERHAUL DRIVE TRAINS--The student will be able to:

03.01 Replace chain and sprocket.
03.02 Overhaul primary drive.
03.03 Overhaul transmission.
03.04 Overhaul shaft drive.
03.05 Service kickstart systems.

04.0 SERVICE, REPAIR, TROUBLESHOOT/DIAGNOSE AND OVERHAUL FUEL AND EXHAUST SYSTEMS--The student will be able to:

04.01 Identify components and operation of carburetors.
04.02 Diagnose and repair slide type carburetors.
04.03 Diagnose and repair CV type carburetors.
04.04 Diagnose and repair fixed venturi carburetors.
04.05 Diagnose and repair exhaust system.
04.06 Troubleshoot and repair fuel delivery systems.

05.0 SERVICE, REPAIR, TROUBLESHOOT/DIAGNOSE AND OVERHAUL ELECTRICAL SYSTEMS--The student will be able to:

05.01 Apply electrical theory.
05.02 Utilize electrical test equipment.
05.03 Read wiring diagram.
05.04 Troubleshoot and repair wire system.
05.05 Troubleshoot and repair battery ignition system.
05.06 Troubleshoot and repair magneto and CDI ignition systems.
05.07 Troubleshoot and repair half-wave and full-wave charging systems.
05.08 Troubleshoot and repair 3-phase charging system.
05.09 Troubleshoot and repair electrical starter system.
05.10 Troubleshoot and repair D.C. generators.

06.0 TUNE-UP MOTORCYCLES--The student will be able to:

06.01 Diagnose performance problems.
06.02 Adjust valve clearance and cam chain.
06.03 Replace ignition points and timing.
06.04 Adjust carburetor and service fuel delivery systems.
06.05 Tune-up two stroke motorcycles.
06.06 Tune-up single cylinder motorcycles (four-stroke).
06.07 Tune-up multi-cyliner motorcycles (four-stroke).
06.08 Service air filters.
06.09 Service and diagnose storage battery.
06.10 Service lubrication system

07.0 SERVICE, REPAIR, TROUBLESHOOT/DIAGNOSE AND OVERHAUL ENGINES--The student will be able to:

07.01 Apply engine operating theory.
07.02 Overhaul single cylinder 4-stroke top-end.
07.03 Overhaul multi-cylinder 4-stroke top-end.
07.04 Overhaul two stroke top-end.
07.05 Rebuild 4-stroke head.
07.06 Perform complete overhaul on single cylinder 4-stroke engines.

07.07 Perform complete overhaul on multi-cyliner 4-stroke engine.
07.08 Perform complete overhaul on two stroke engine.
07.09 Rebuild built-up crankshaft.
07.10 Service plain bearing crankshaft.
07.11 Service and repair water cooling systems.

08.0 APPLY ALLIED TRADES--The student will be able to:

08.01 Utilize oxyactylene welding outfit for heating, welding, brazing and cutting.
08.02 Utilize propane torch for miscellaneous operations.
08.03 Perform specialized welding operations.
08.04 Rebore cylinder.
08.05 Perform basic metal lathe operations.
08.06 Demonstrate understanding of safety rules.
08.07 Demonstrate understanding of shop and class procedures.
08.08 Identify hand tools.
08.09 Utilize measuring tools.
08.10 Utilize and maintain basic shop equipment.
08.11 Identify and use standard fasteners.
08.12 Identify gaskets and choose sealants.
08.13 Use parts and service manuals.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Occupational Safety and Health Technology

CODE NUMBER: Secondary ______ Postsecondary ETI0700

Florida CIP IN15.070100

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____ 7-9 _____ 9-12 _____ Postsecondary Adult Vocational

_____ Postsecondary Vocational __x__ Other 13-15

CERTIFICATION COVERAGE: ANY IND EDUCATION LEVEL 7 OSHA 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to provide supplemental training for persons previously or currently employed in a wide range of industrial and technical occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, state and federal safety and workplace health legislation and standards, hazard recognition and avoidance, workplace analysis/safety inspections, and preparation and interpretation of technical reports and data.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in workplace hazard recognition, equipment use, safety inspections, and developing costs analyses for corrective actions.

III. SPECIAL NOTE: The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The typical length of this program for the average achieving student is 40 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate working knowledge of the Occupational Safety and Health Act and standards that relate to a specific industry.
02. Deliver safety instruction effectively.
03. Demonstrate an understanding of employer/employee relationships to develop and maintain a safe working environment.
04. Recognize workplace hazards and corrective action to take.
05. Orient new workers to their jobs so they work in an efficient and safe manner.
06. Develop a safety-training plan for a work site.
07. Complete a job safety analysis.
08. Conduct a workplace safety analysis and write a plan for corrective action.
09. Prepare, analyze, and evaluate technical data.
10. Develop or modify a safety program.

PROGRAM AREA: Industrial **SECONDARY NUMBER:** ________

PROGRAM TITLE: Occupational Safety and Health Technology **POSTSECONDARY NUMBER:** ETI0700

01.0 DEMONSTRATE A WORKING KNOWLEDGE OF THE OCCUPATIONAL SAFETY AND HEALTH ACT AND STANDARDS THAT RELATE TO A SPECIFIC INDUSTRY--The student will be able to:

01.01 Explain how Congressional action becomes regulation.
01.02 Locate standards for theoretical situations, using a regulation book.

02.0 DELIVER SAFETY INSTRUCTION EFFECTIVELY--The student will be able to:

02.01 Using acceptable teaching/training methods, conduct a safety training session.
02.02 Develop and use a pre-test and post-test.

03.0 DEMONSTRATE AN UNDERSTANDING OF EMPLOYER/EMPLOYEE RELATIONSHIPS TO DEVELOP AND MAINTAIN A SAFE WORKING ENVIRONMENT--The student will be able to:

03.01 Explain how to organize a safety committee.
03.02 Explain the purpose and function of a safety committee.
03.03 Develop an incentive program for a company.
03.04 Explain how unions or employee organizations impact on work procedures and safety.

04.0 RECOGNIZE WORK PLACE HAZARDS AND CORRECTIVE ACTION TO TAKE--The student will be able to:

04.01 Identify work place hazards and specify corrective action to be taken.
04.02 Identify potential hazards and explain worker behavior around the hazards.

05.0 ORIENT NEW WORKERS TO THEIR JOBS SO THEY WILL WORK IN AN EFFICIENT AND SAFE MANNER--The student will be able to:

05.01 Explain the importance of properly trained workers, especially in hazardous occupations.
05.02 Develop an outline to use in training workers to do their jobs safely and efficiently.
05.03 Develop a job related pre-test and post-test.

06.0 DEVELOP A SAFETY-TRAINING PLAN FOR A WORK SITE--The student will be able to:

06.01 Identify job skills or tasks required of different occupations or positions in a work place.
06.02 Develop training activities for identified skills that will reduce or eliminate injuries.

07.0 COMPLETE A JOB SAFETY ANALYSIS--The student will be able to:

07.01 Explain the purpose of a job safety analysis (JSA).
07.02 Conduct a JSA on the activities of a specific worker in a specific industry.

08.0 CONDUCT A WORK PLACE SAFETY ANALYSIS AND WRITE A PLAN FOR CORRECTIVE ACTION--The student will be able to:

08.01 Perform a work place inspection using Occupational Safety and Health Administration (OSHA) Standards.
08.02 Cite specific regulations and standards for items not in compliance during a safety inspection.
08.03 Develop a written plan of alternative solutions or corrective actions with appropriate cost and cost benefit statements.

09.0 PREPARE, ANALYZE AND EVALUATE TECHNICAL DATA--The student will be able to:

09.01 Prepare cost and cost benefit statements for specific corrective actions.
09.02 Analyze and explain accident incidence statistics.

10.0 DEVELOP OR MODIFY A SAFETY PROGRAM--The student will be able to:

10.01 Develop a safety program, given a specific work place situation.
10.02 Modify an existing training program to reflect new circumstances, i.e. new work place hazards.

FLORIDA DEPARTMENT OF EDUCATION   EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Office Machine Maintenance

CODE NUMBER: Secondary 8715000   Postsecondary ______

Florida CIP IN47.012200

SECONDARY SCHOOL CREDITS 6   COLLEGE CREDITS ______   POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9   ____9-12   ____Postsecondary Adult Vocational

______ Postsecondary Vocational   x Other 10-12, 21

CERTIFICATION COVERAGE: BUS MACH 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as office machine servicers (50082400), typewriter servicers (633.281-018), or office machine servicers (633.281-018)

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and knowledge of tasks and equipment used in office machine maintenance.

Listed below are the courses that comprise this program when offered at the secondary level:

8715010	Office Machine Maintenance 1
8715020	Office Machine Maintenance 2
8715030	Office Machine Maintenance 3
8715040	Office Machine Maintenance 4
8715050	Office Machine Maintenance 5
8715060	Office Machine Maintenance 6

II. LABORATORY ACTIVITIES: Office machine maintenance laboratory hands-on activities are an integral part of this program. The tools, equipment, material and processes used in the laboratory are similar to those used in business and industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

Algebra is recommended as a prerequisite for entry into this program.

Students should not be color blind.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Analyze all phases of DC circuits related to office machine maintenance.
02. Demonstrate a knowledge of and practice all laboratory procedures related to office machine maintenance.
03. Troubleshoot and maintain electronic typewriters.
04. Troubleshoot and maintain electromechanical typewriters.
05. Troubleshoot and maintain electronic printing calculators.
06. Demonstrate employability skills.
07. Demonstrate an understanding of entrepreneurship.

PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8715000

PROGRAM TITLE: Office Machine Maintenance POSTSECONDARY NUMBER: ______

01.0 ANALIZE ALL PHASES OF D.C. CIRCUITS RELATED TO OFFICE MACHINE MAINTENANCE--The student will be able to:

01.01 Solve basic algebraic problems as applicable to electronics (program prerequisite).
01.02 Relate electricity to nature of matter.
01.03 Identify sources of electricity.
01.04 Define voltage, current, resistance, power, and energy.
01.05 Apply and relate Ohms Law.
01.06 Read and interpret color codes to identify resistors.
01.07 Measure properties of a circuit using VOM and DVM meters.
01.08 Compute and measure conductance and resistance of conductors and insulators.
01.09 Analyze series circuits.
01.10 Construct series circuits.
01.11 Troubleshoot series-parallel circuits.
01.12 Analyze parallel circuits.
01.13 Construct parallel circuits.
01.14 Troubleshoot parallel circuits.
01.15 Construct series-parallel circuits.
01.16 Analyze voltage dividers (loaded and unloaded).
01.17 Construct voltage dividers (loaded and unloaded).
01.18 Troubleshoot voltage dividers (loaded and unloaded).
01.19 Solve network theorem problems using Kirchhoff, (V & I), Thevenin, Norton, Superposition, and Delta-Wye.
01.20 Analyze maximum power transfer theory.
01.21 Construct maximum power transfer theory.
01.22 Troubleshoot maximum power transfer theory.
01.23 Define magnetic properties of circuits and devices.
01.24 Determine physical and electrical.
01.25 Analyze and measure RL and RD time constants.
01.26 Set up and operate VOM for DC circuits.
01.27 Set up and operate DVM for DC circuits.
01.28 Set up and operate power supplies for DC circuits.
01.29 Set up and operate oscilloscopes for DC circuits.

02.0 DEMONSTRATE A KNOWLEDGE OF AND PRACTICE ALL LABORATORY PROCEDURES RELATED TO OFFICE MACHINE MAINTENANCE--The student will be able to:

02.01 Apply proper safety standards.
02.02 Make electrical connections.
02.03 Identify and use hand tools properly.
02.04 Identify and use power tools properly.
02.05 Handle static sensitive devices.
02.06 Identify and use fasteners (screws, washers, pins, connectors).
02.07 Establish and maintain an effective inventory control system.
02.08 Establish and maintain an effective parts control system for use in laboratory and maintenance vehicles.
02.09 Solder using proper soldering techniques.
02.10 Set up and operate scales.
02.11 Set up and operate micrometers.
02.12 Set up and operate rules.
02.13 Set up and operate drill blocks.
02.14 Set up and operate dial indicators.
02.15 Set up and operate vernier scales.
02.16 Set up and operate mechanical and optical measuring devices.
02.17 Set up and operate height gauges.
02.18 Set up and operate depth gauges.
02.19 Read and convert measurements.
02.20 Perform preventative maintenance according to vendor specifications.
02.21 Develop and implement preventative maintenance schedules.

03.0 TROUBLESHOOT AND MAINTAIN ELECTRONIC TYPEWRITERS--The student will be able to:

03.01 Read and interpret schematic and block diagrams of electronic typewriters.
03.02 Determine the defective status of keyboards.
03.03 Troubleshoot keyboards.
03.04 Remove and replace keyboards or components.

03.05 Perform operating systems check and make minor adjustments to keyboards.
03.06 Perform preventive maintenance on keyboards.
03.07 Determine the defective status of logic boards.
03.08 Troubleshoot logic boards.
03.09 Remove and replace logic boards of components.
03.10 Perform operating systems check and make minor adjustments to logic boards.
03.11 Perform preventive maintenance on logic boards.
03.12 Determine the defective status of printing carriers.
03.13 Troubleshoot printing carriers.
03.14 Remove and replace printing carriers or components.
03.15 Perform operating systems check and make minor adjustments to printing carriers.
03.16 Perform preventive maintenance on printing carriers.
03.17 Determine the defective status of power supplies.
03.18 Troubleshoot power supplies.
03.19 Remove and replace power supplies or components.
03.20 Perform operating systems check and make minor adjustments to power supplies.
03.21 Perform preventive maintenance on power supplies.

04.0 TROUBLESHOOT AND MAINTAIN ELECTROMECHANICAL TYPEWRITERS--The student will be able to:

04.01 Read and interpret schematic and block diagrams of electromechanical typewriters.
04.02 Determine the defective status of excapement mechanisms.
04.03 Troubleshoot excapement mechanisms.
04.04 Remove and replace excapement mechanisms or components.
04.05 Perform operating systems check and make minor adjustments to excapement mechanisms.
04.06 Perform preventive maintenance on excapement mechanisms.
04.07 Determine the defective status of keyboards.
04.08 Troubleshoot keyboards.
04.09 Remove and replace keyboards or components.
04.10 Perform operating systems check and make minor adjustments to keyboards.
04.11 Perform preventive maintenance on keyboards.
04.12 Determine the defective status of printing carriers.
04.13 Troubleshoot printing carriers.
04.14 Remove and replace printing carriers or components.
04.15 Perform operating systems check and make minor adjustment to printing carriers.
04.16 Perform preventive maintenance on printing carriers.
04.17 Determine the defective status of cycle clutch drives including motor.
04.18 Troubleshoot cycle clutch drives including motor.
04.19 Remove and replace cycle clutch drives including motor or components.
04.20 Perform operating systems check and make minor adjustments to cycle clutch drives including motor.
04.21 Perform preventive maintenance on cycle clutch drives including motor.
04.22 Determine the defective status of op-cam shafts.
04.23 Troubleshoot op-cam shafts.
04.24 Remove and replace op-cam shafts or components.
04.25 Perform operating systems check and make minor adjustments to op-cam shafts.
04.26 Perform preventive maintenance on op-cam shafts.

05.0 TROUBLESHOOT AND MAINTAIN ELECTRONIC PRINTING CALCULATORS--The student will be able to:

05.01 Read and interpret schematic and block diagrams on electronic printing calculators.
05.02 Determine the defective status of power supplies.
05.03 Troubleshoot power supplies.
05.04 Remove and replace power supplies or components.

05.05 Perform operating systems check and make minor adjustments to power supplies.
05.06 Perform preventive maintenance on power supplies.
05.07 Determine defective status of printing carriers.
05.08 Troubleshoot printing carriers.
05.09 Remove and replace printing carriers or components.
05.10 Perform operating systems check and make minor adjustments to printing carriers.
05.11 Perform preventive maintenance on printing carriers.
05.12 Determine defective status of logic boards.
05.13 Troubleshoot logic boards.
05.14 Remove and replace logic boards or components.
05.15 Perform operating systems check and make minor adjustments to logic boards.
05.16 Perform preventive maintenance on logic boards.
05.17 Determine defective status of keyboards.
05.18 Troubleshoot keyboards.
05.19 Remove and replace keyboards or components.
05.20 Perform operating systems check and make minor adjustments to keyboards.
05.21 Perform preventive maintenance on keyboards.

06.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

06.01 Conduct a job search.
06.02 Secure information about a job.
06.03 Identify documents which may be required when applying for a job interview.
06.04 Complete a job application form correctly.
06.05 Demonstrate competence in job interview techniques.
06.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
06.07 Identify acceptable work habits.
06.08 Demonstrate knowledge of how to make job changes appropriately.
06.09 Demonstrate acceptable employee health habits.

07.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

07.01 Define entrepreneurship.
07.02 Describe the importance of entrepreneurship to the American economy.
07.03 List the advantages and disadvantages of business ownership.
07.04 Identify the risks involved in ownership of a business.
07.05 Identify the necessary personal characteristics of a successful entrepreneur.
07.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Office Machine Maintenance PROGRAM NUMBER: 8715000

COURSE TITLE: Office Machine Maintenance 1 COURSE NUMBER: 8715010

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in safety procedures, power/hand tool use and measuring.

01.0 ANALIZE ALL PHASES OF D.C. CIRCUITS RELATED TO OFFICE MACHINE MAINTENANCE--The student will be able to:

01.09 Analyze series circuits.
01.10 Construct series circuits.
01.11 Troubleshoot series-parallel circuits.
01.12 Analyze parallel circuits.
01.13 Construct parallel circuits.
01.14 Troubleshoot parallel circuits.
01.15 Construct series-parallel circuits.
01.16 Analyze voltage dividers (loaded and unloaded).
01.17 Construct voltage dividers (loaded and unloaded).
01.18 Troubleshoot voltage dividers (loaded and unloaded).
01.19 Solve network theorem problems using Kirchhoff, (V & I), Thevenin, Norton, Superposition, and Delta-Wye.
01.20 Analyze maximum power transfer theory.
01.21 Construct maximum power transfer theory.
01.22 Troubleshoot maximum power transfer theory.
01.23 Define magnetic properties of circuits and devices.
01.24 Determine physical and electrical.
01.25 Analyze and measure RL and RD time constants.
01.26 Set up and operate VOM for DC circuits.
01.27 Set up and operate DVM for DC circuits.
01.28 Set up and operate power supplies for DC circuits.
01.29 Set up and operate oscilloscopes for DC circuits.

02.0 DEMONSTRATE A KNOWLEDGE OF AND PRACTICE ALL LABORATORY PROCEDURES RELATED TO OFFICE MACHINE MAINTENANCE--The student will be able to:

02.01 Apply proper safety standards.
02.02 Make electrical connections.
02.03 Identify and use hand tools properly.
02.04 Identify and use power tools properly.
02.05 Handle static sensitive devices.
02.06 Identify and use fasteners (screws, washers, pins, connectors).
02.07 Establish and maintain an effective inventory control system.
02.08 Establish and maintain an effective parts control system for use in laboratory and maintenance vehicles.
02.09 Solder using proper soldering techniques.
02.10 Set up and operate scales.
02.11 Set up and operate micrometers.
02.12 Set up and operate rules.
02.13 Set up and operate drill blocks.
02.14 Set up and operate dial indicators.
02.15 Set up and operate vernier scales.
02.16 Set up and operate mechanical and optical measuring devices.
02.17 Set up and operate height gauges.
02.18 Set up and operate depth gauges.
02.19 Read and convert measurements.
02.20 Perform preventative maintenance according to vendor specifications.
02.21 Develop and implement preventative maintenance schedules.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Office Machine Maintenance PROGRAM NUMBER: 8715000

COURSE TITLE: Office Machine Maintenance 2 COURSE NUMBER: 8715020

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in D.C. circuits as related to office machines.

01.0 ANALIZE ALL PHASES OF D.C. CIRCUITS RELATED TO OFFICE MACHINE MAINTENANCE--The student will be able to:

01.01 Solve basic algebraic problems as applicable to electronics (program prerequisite).
01.02 Relate electricity to nature of matter.
01.03 Identify sources of electricity.
01.04 Define voltage, current, resistance, power, and energy.
01.05 Apply and relate Ohms Law.
01.06 Read and interpret color codes to identify resistors.
01.07 Measure properties of a circuit using VOM and DVM meters.
01.08 Compute and measure conductance and resistance of conductors and insulators.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Office Machine Maintenance PROGRAM NUMBER: 8715000

COURSE TITLE: Office Machine Maintenance 3 COURSE NUMBER: 8715030

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experiences in troubleshooting and maintaining electronic typewriters.

03.0 TROUBLESHOOT AND MAINTAIN ELECTRONIC TYPEWRITERS--The student will be able to:

03.01 Read and interpret schematic and block diagrams of electronic typewriters.
03.02 Determine the defective status of keyboards.
03.03 Troubleshoot keyboards.
03.04 Remove and replace keyboards or components.
03.05 Perform operating systems check and make minor adjustments to keyboards.
03.06 Perform preventive maintenance on keyboards.
03.07 Determine the defective status of logic boards.
03.08 Troubleshoot logic boards.
03.09 Remove and replace logic boards of components.
03.10 Perform operating systems check and make minor adjustments to logic boards.
03.11 Perform preventive maintenance on logic boards.
03.12 Determine the defective status of printing carriers.
03.13 Troubleshoot printing carriers.
03.14 Remove and replace printing carriers or components.
03.15 Perform operating systems check and make minor adjustments to printing carriers.
03.16 Perform preventive maintenance on printing carriers.
03.17 Determine the defective status of power supplies.
03.18 Troubleshoot power supplies.
03.19 Remove and replace power supplies or components.
03.20 Perform operating systems check and make minor adjustments to power supplies.
03.21 Perform preventive maintenance on power supplies.

STUDENT PERFORMANCE STANDARDS	EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial	COURSE CREDIT: 1
PROGRAM TITLE: Office Machine Maintenance	PROGRAM NUMBER: 8715000
COURSE TITLE: Office Machine Maintenance 4	COURSE NUMBER: 8715040

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in troubleshooting and maintaining electromechanical typewriters.

04.0 TROUBLESHOOT AND MAINTAIN ELECTROMECHANICAL TYPEWRITERS--The student will be able to:

04.01 Read and interpret schematic and block diagrams of electromechanical typewriters.
04.02 Determine the defective status of excapement mechanisms.
04.03 Troubleshoot excapement mechanisms.
04.04 Remove and replace excapement mechanisms or components.
04.05 Perform operating systems check and make minor adjustments to excapement mechanisms.
04.06 Perform preventive maintenance on excapement mechanisms.
04.07 Determine the defective status of keyboards.
04.08 Troubleshoot keyboards.
04.09 Remove and replace keyboards or components.
04.10 Perform operating systems check and make minor adjustments to keyboards.
04.11 Perform preventive maintenance on keyboards.
04.12 Determine the defective status of printing carriers.
04.13 Troubleshoot printing carriers.
04.14 Remove and replace printing carriers or components.
04.15 Perform operating systems check and make minor adjustment to printing carriers.
04.16 Perform preventive maintenance on printing carriers.
04.17 Determine the defective status of cycle clutch drives including motor.
04.18 Troubleshoot cycle clutch drives including motor.
04.19 Remove and replace cycle clutch drives including motor or components.
04.20 Perform operating systems check and make minor adjustments to cycle clutch drives including motor.
04.21 Perform preventive maintenance on cycle clutch drives including motor.
04.22 Determine the defective status of op-cam shafts.
04.23 Troubleshoot op-cam shafts.
04.24 Remove and replace op-cam shafts or components.
04.25 Perform operating systems check and make minor adjustments to op-cam shafts.
04.26 Perform preventive maintenance on op-cam shafts.

STUDENT PERFORMANCE STANDARDS	EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial	COURSE CREDIT: 1
PROGRAM TITLE: Office Machine Maintenance	PROGRAM NUMBER: 8715000
COURSE TITLE: Office Machine Maintenance 5	COURSE NUMBER: 8715050

COURSE DESCRIPTION:

This course will provide instruction and shop/lab experience in troubleshooting and maintaining electronic printing calculators.

05.0 TROUBLESHOOT AND MAINTAIN ELECTRONIC PRINTING CALCULATORS--The student will be able to:

05.01 Read and interpret schematic and block diagrams on electronic printing calculators.
05.02 Determine the defective status of power supplies.
05.03 Troubleshoot power supplies.
05.04 Remove and replace power supplies or components.

05.05 Perform operating systems check and make minor adjustments to power supplies.
05.06 Perform preventive maintenance on power supplies.
05.07 Determine defective status of printing carriers.
05.08 Troubleshoot printing carriers.
05.09 Remove and replace printing carriers or components.
05.10 Perform operating systems check and make minor adjustments to printing carriers.
05.11 Perform preventive maintenance on printing carriers.
05.12 Determine defective status of logic boards.
05.13 Troubleshoot logic boards.
05.14 Remove and replace logic boards or components.
05.15 Perform operating systems check and make minor adjustments to logic boards.
05.16 Perform preventive maintenance on logic boards.
05.17 Determine defective status of keyboards.
05.18 Troubleshoot keyboards.
05.19 Remove and replace keyboards or components.
05.20 Perform operating systems check and make minor adjustments to keyboards.
05.21 Perform preventive maintenance on keyboards.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Office Machine Maintenance — PROGRAM NUMBER: 8715000

COURSE TITLE: Office Machine Maintenance 6 — COURSE NUMBER: 8715060

COURSE DESCRIPTION:

This course will provide instruction and lab experience with employability skills.

06.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

06.01 Conduct a job search.
06.02 Secure information about a job.
06.03 Identify documents which may be required when applying for a job interview.
06.04 Complete a job application form correctly.
06.05 Demonstrate competence in job interview techniques.
06.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
06.07 Identify acceptable work habits.
06.08 Demonstrate knowledge of how to make job changes appropriately.
06.09 Demonstrate acceptable employee health habits.

07.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

07.01 Define entrepreneurship.
07.02 Describe the importance of entrepreneurship to the American economy.
07.03 List the advantages and disadvantages of business ownership.
07.04 Identify the risks involved in ownership of a business.
07.05 Identify the necessary personal characteristics of a successful entrepreneur.
07.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Optical Technology

CODE NUMBER: Secondary ______ Postsecondary OPT0900

Florida CIP IN15.060600

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-17

CERTIFICATION COVERAGE: TEC MECH @ 7 TEC CHEM 7 TEC OPTICS 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as lens grinders (50143001), lens surfacers (716.681-018), precision lens polishers (716.682-018), precision lens technicians (716.280-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, anatomy and physiology of the eye, lens forming and fabricating, developing the skill in performing the manipulative technique required in the practice of ophthalmic technology.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in a laboratory setting using hands-on experiences uses glass and plastic lens, implements and equipment appropriate to the programs content in accordance with current practices in the trade.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1440 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate understanding of ophthalmic technology procedures.
02. Define terminologies relating to ophthalmic technology.
03. Identify lenses and prescriptions.
04. Perform math for prescription lens.
05. Use and care for hand tools.
06. Use charts and manuals.
07. Demonstrate understanding of lens surfacing lab procedures.
08. Grind bifocal lenses.
09. Grind special type lenses.
10. Grind prism in all types of lenses.
11. Grind prescription lenses.

12. Demonstrate understanding of finishing lab procedures.
13. Fabricate all types of lenses into frames.
14. Demonstrate special types edges lenses.
15. Grind and fabricating all types of lenses.
16. Demonstrate understanding of procedures for plastics lens labs.
17. Grind and fabricating plastic s.v. lenses.
18. Grind and fabricating plastic bifocal lenses.
19. Dye all types of plastic lenses.
20. Maintain optical equipment.
21. Demonstrate employability skills.
22. Demonstrate an understanding of entrepreneurship.

PROGRAM AREA: Industrial SECONDARY NUMBER: __________

PROGRAM TITLE: Optical Technology POSTSECONDARY NUMBER: OPT0900

01.0 DEMONSTRATE UNDERSTANDING OF OPHTHALMIC TECHNOLOGY PROCEDURES--The student will be able to:

01.01 Identify philosophy, job description, job station.
01.02 Clean ophthalmic lab.
01.03 Explain history of glass and plastic.

02.0 DEFINE TERMINOLOGIES RELATING TO OPHTHALMIC TECHNOLOGY--The student will be able to:

02.01 Demonstrate theory of light RX.
02.02 Measure with metric system.
02.03 Explain index of refraction and reflection.
02.04 Identify terminology.
02.05 Identify anatomy and physiology of the eye.

03.0 IDENTIFY LENSES AND PRESCRIPTIONS--The student will be able to:

03.01 Identify types of single vision lenses.
03.02 Identify types of bifocal lenses.
03.03 Identify the diopter system.
03.04 Analyze doctor's prescription.

04.0 PERFORM MATH FOR PRESCRIPTION LENS--The student will be able to:

04.01 Transpose prescription.
04.02 Calculate curves to be ground on lenses.
04.03 Calculate thickness for lens.
04.04 Calculate decentration for lens.
04.05 Calculate prism for lens.
04.06 Combine RX elements.

05.0 USE AND CARE FOR HAND TOOLS--The student will be able to:

05.01 Read a Lensometer.
05.02 Read lens clock and thickness calipers.
05.03 Read brass gauges.
05.04 Explain the ANSI Z80-1 1972 standards.

06.0 USE CHARTS AND MANUALS--The student will be able to:

06.01 Read Base Curve Selection chart.
06.02 Write job tickets.
06.03 Measure with P.D. Ruler, frame and parts.
06.04 Take vertex power test.
06.05 Describe lab safety procedure.
06.06 List procedures for entering surface lab.

07.0 DEMONSTRATE UNDERSTANDING OF LENS SURFACING LAB PROCEDURES--The student will be able to:

07.01 Complete all test-Orientation in surface lab.
07.02 Maintain and clean surface machines daily.
07.03 Grind 4 pair single vision lenses + and - side.

08.0 GRIND BIFOCAL LENSES--The student will be able to:

08.01 Grind 6 pair kryptok lens, sphere and cylinder - side.
08.02 Grind 4 pair flat top lens, sphere and cylinder - side.
08.03 Grind 2 pair curve top lenses - side.
08.04 Grind 2 pair single vision plus cylinder - side.
08.05 Grind 4 pair executive lenses minus side.

09.0 GRIND SPECIAL TYPE LENSES--The student will be able to:

09.01 Grind 2 lens above range of generator on - side.
09.02 Grind 2 pair lenses below - 300 diopter on generator.
09.03 Grind 2 pair myo-disc lenses on minus side.
09.04 Grind 2 pair photo gray lenses.
09.05 Grind 4 pair invisible bifocal lenses.

10.0 GRIND PRISM IN ALL TYPES OF LENSES--The student will be able to:

10.01 Grind 7 pair lenses with prism on all type bifocals.
10.02 Grind 3 pair special type bifocals.
10.03 Grind 4 pair ultex lenses on plus side.

11.0 GRIND PRESCRIPTION LENSES--The student will be able to:

11.01 Cut 6 sphere & cylinder laps.
11.02 Grind 3 pair lens as Post-Test
11.03 Account for breakage.

12.0 DEMONSTRATE UNDERSTANDING OF FINISHING LAB PROCEDURES--The student will be able to:

12.01 Perform procedures for entering finish lab.
12.02 Clean and maintain machines daily.
12.03 Perform hand beveling on ceramic & diamond wheels.
12.04 Mount lenses into frame (metal & plastic).
12.05 Make patterns.

13.0 FABRICATE ALL TYPES OF LENSES INTO FRAMES--The student will be able to:

13.01 Fabricate glasses using 2 S.V. sphere lens.
13.02 Fabricate glasses using S.V. vision + and - lens.
13.03 Fabricate glasses using 2 kryptok bifocal S.V.
13.04 Fabricate glasses using kryptok bifocal cylinder lens.
13.05 Fabricate glasses using 2 flat top bifocal sphere lens.
13.06 Fabricate glasses using flat top bifocal cylinder lens.
13.07 Fabricate glasses using 2 executive bifocal sphere lens.
13.08 Fabricate glasses using executive bifocal cylinder lens.
13.09 Fabricate glasses using dryptok cylinder lens.
13.10 Fabricate glasses using flat top cylinder lens.
13.11 Fabricate glasses using executive cylinder lens.

14.0 DEMONSTRATE SPECIAL TYPES EDGES ON LENSES--The student will be able to:

14.01 Fabricate glasses using high minus lenses.
14.02 Fabricate glasses using high plus lenses.
14.03 Block lenses for edging using alloy blocker.
14.04 Demonstrate hide-a-bevel.
14.05 Fabricate rimless glasses.
14.06 Fabricate Ultex Spheres.
14.07 Fabricate Ultex Cylinders.
14.08 Fabricate 4 pair glass S.V. lens into frames.
14.09 Account for breakage.
14.10 Fabricate Logo Frames.

15.0 GRIND AND FABRICATE ALL TYPES OF LENSES--The student will be able to:

15.01 Grind and fabricate single vision blanks.
15.02 Grind and fabricate semi-finished - cylinder blanks.
15.03 Grind and fabricate semi-finished + blanks.
15.04 Grind and fabricate semi-finished cylinder blanks.
15.05 Grind and fabricate semi-finished flat top bifocals.
15.06 Grind and fabricate semi-finished kryptok bifocals.
15.07 Grind and fabricate semi-finished curve top bifocals.
15.08 Grind and fabricate compound prism bifocals.
15.09 Grind and fabricate semi-finished oversize blanks.
15.10 Grind and fabricate semi-finished trifocals.
15.11 Grind and fabricate semi-finished occupational bifocal.
15.12 Grind and fabricate semi-finished Ex. bifocal.
15.13 Account for breakage.
15.14 Align frames.
15.15 Fabricate 4 pair glass lens into cylinder frame.
15.16 Fabricate 4 pair bifocal lens into metal frame.

16.0 DEMONSTRATE UNDERSTANDING OF PROCEDURES FOR PLASTIC LENS LAB--The student will be able to:

16.01 Complete all job tickets-orientation of plastic lens lab.
16.02 Clean and maintain machines daily.
16.03 Demonstrate Sag-Dial and Computer.

17.0 GRIND AND FABRICATE PLASTIC SINGLE VISION LENSES--The student will be able to:

17.01 Grind 2 pair S.V. sphere.
17.02 Grind 2 pair S.V. cylinder.
17.03 Fabricate 4 pair S.V. lens.
17.04 Grind and fabricate 2 pair S.V. high cylinder.

18.0 GRIND AND FABRICATE PLASTIC BIFOCAL LENSES--The student will be able to:

18.01 Grind and fabricate 3 pair kryptok.
18.02 Grind and fabricate 3 pair flat top.
18.03 Grind and fabricate 2 pair special type bifocal.
18.04 Grind and fabricate 4 pair Executive bifocals.

19.0 DYE ALL TYPES OF PLASTIC LENSES--The student will be able to:

19.01 Develop employability skills.
19.02 Dye plastic lens - 6 pairs.
19.03 Account for breakage.
19.04 Fabricate 4 pair plastic lens plastic frame.
19.05 Fabricate 4 pair plastic lens metal frame.

20.0 MAINTAIN OPTICAL EQUIPMENT--The student will be able to:

20.01 Clean tanks and edgers.
20.02 Check size and axis of edgers.
20.03 Change generator tanks.
20.04 Check generator curve thickness and prism.
20.05 Clean hand stone, tanks and sponges.
20.06 Clean and fix reclaim tanks.
20.07 Remove and replace air filters in all labs.

21.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

21.01 Conduct a job search.
21.02 Secure information about a job.
21.03 Identify documents which may be required when applying for a job interview.
21.04 Complete a job application form correctly.
21.05 Demonstrate competence in job interview techniques.
21.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
21.07 Identify acceptable work habits.
21.08 Demonstrate knowledge of how to make job changes appropriately.
21.09 Demonstrate acceptable employee health habits.

22.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

22.01 Define entrepreneurship.
22.02 Describe the importance of entrepreneurship to the American economy.
22.03 List the advantages and disadvantages of business ownership.
22.04 Identify the risks involved in ownership of a business.
22.05 Identify the necessary personal characteristics of a successful entrepreneur.
22.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Ornamental Iron Work

CODE NUMBER: Secondary ______ Postsecondary MTR0251

Florida CIP IN48.059901

SECONDARY SCHOOL CREDITS _____ COLLEGE CREDITS _____ POSTSECONDARY ADULT VOCATIONAL CREDITS _____

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

_____ Postsecondary Vocational x Other 13-17

CERTIFICATION COVERAGE: ORNA IRON 7 METAL WORK @7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as ornamental iron workers (809.381-002), ornamental iron helpers (869.664-014), ornamental-metal workers (619.360-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, installation of prefabricated ornamental ironwork, fabrication of custom ornamental ironwork, including metal door and window frames, motor driven and power operated doors, metal trim and paneling, and aluminum curtain-wall frames.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in cutting, shaping, welding, work from blueprints, manufacturers procedures and verbal descriptions.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1560 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Erect ornamental iron.
02. Fabricate reinforcing steel.
03. Erect structural steel.
04. Perform rigging operations.
05. Perform reeving operations.
06. Identify proper sling use.
07. Perform heavy rigging.
08. Access structures.
09. Read and interpret blueprints.
10. Perform welding operations.
11. Erect steel fences.
12. Apply metal decking.

13.0 Identify proper use of fiber line.
14.0 Demonstrate employability skills.
15.0 Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
SECONDARY NUMBER: __________
PROGRAM TITLE: Ornamental Iron Work
POSTSECONDARY NUMBER: MTR0251

01.0 ERECT ORNAMENTAL IRON--The student will be able to:

01.01 Understand the use of squares, levels, transits, rulers and other tools for preparing layout work.
01.02 Identify various types of doors and frames that are used in iron working.
01.03 Demonstrate how to erect doors and frames.
01.04 Identify types of gratings and grills and methods of installing them.
01.05 Identify types of handrails and methods of installing them.
01.06 Identify types of stairways and rails and methods of installing them.

02.0 FABRICATE REINFORCING STEEL--The student will be able to:

02.01 Fabricate reinforcing steel.
02.02 Erect, place and tie reinforcing steel.

03.0 ERECT STRUCTURAL STEEL--The student will be able to:

03.01 Identify various connections of beams, columns, and any other structural members.
03.02 Execute connections of beams, columns, and other structural members.
03.03 Execute proper method of hooking steel beams and columns for hoisting in building erection.
03.04 Demonstrate correct hand signals for all cranes, derricks and gin poles.
03.05 Assemble various types of cranes, derricks and gin poles.
03.06 Identify types of splices used for all phases of wire rope.
03.07 Demonstrate all types of splicing for wire rope.

04.0 PERFORM RIGGING OPERATIONS--The student will be able to:

04.01 Identify rigging hardware.
04.02 Describe and demonstrate, when possible, rigging applications.

05.0 PERFORM REEVING OPERATIONS--The student will be able to:

05.01 Identify different types of blocks and their safe working load.
05.02 Compute the mechanical advantages of compound tackle systems.
05.03 Reeve and lace wire rope through the blocks and sheaves.

06.0 IDENTIFY PROPER SLING USE--The student will be able to:

06.01 Identify types of slings.
06.02 Identify practical uses of slings.

07.0 PERFORM HEAVY RIGGING--The student will be able to:

07.01 Identify center of gravity and picking points for heavy loads.
07.02 Identify methods to hoist heavy loads correctly into place.

08.0 ACCESS STRUCTURES--The student will be able to:

08.01 Identify access structures.
08.02 Identify methods of rigging access structure.

09.0 READ AND INTERPRET BLUEPRINTS--The student will be able to:

09.01 Identify types of blueprints.
09.02 Identify blueprint symbols, abbreviations, markings and details.
09.03 Identify control and measurement lines.
09.04 Understand the translation from blueprint to practical use.

10.0 PERFORM WELDING OPERATIONS--The student will be able to:

10.01 Identify types of welds.
10.02 Identify types of welding machines, rods and wires.
10.03 Demonstrate practical applications of various types of welding procedures on ferrous and non-ferrous metals to enable students to pass welding certification tests.

10.04 Understand the principles of free-standing towers and guy towers and the methods of recting them.

11.0 ERECT STEEL FENCES--The student will be able to:

11.01 Layout steel fences.
11.02 Erect steel fences.

12.0 APPLY METAL DECKING--The student will be able to:

12.01 Identify various types of metal decking and sheeting.
12.02 Understand proper handling of placing of metal decking and sheeting.
12.03 Demonstrate proper placing or erection techniques for metal decking and sheeting.

13.0 IDENTIFY PROPER USE OF FIBER LINE--The student will be able to:

13.01 Identify all types of fiber line.
13.02 Understand the effects of climate on fiber line.
13.03 Identify various types of knots, their uses, and advantages and disadvantages.
13.04 Demonstrate various splices, knots, bends and hitches.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK — PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION — EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Painting and Decorating

CODE NUMBER: Secondary 8721500 — Postsecondary BCT0160

Florida CIP IN46.040800

SECONDARY SCHOOL CREDITS 6 — COLLEGE CREDITS ______ — POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ______ 7-9 ______ 9-12 ______ Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 10-12, 13-17, 21

CERTIFICATION COVERAGE: TEC CONSTR @ 7 PAINTING 7
BLDG CONST @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as painters, construction (50022000), paperhangers (50022600), painters (840.381-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, materials and cost estimates, surface preparation, paint mixing and matching, application procedures, special effects, wall covering application, blue print reading, ladder and scaffold erection and use, selection, application and care of materials, use of hand and power tools, and use of current industry standards, practices and techniques.

Listed below are the courses that comprise this program when offered at the secondary level:

8721510	Painting and Decorating 1
8721520	Painting and Decorating 2
8721530	Painting and Decorating 3
8721540	Painting and Decorating 4
8721550	Painting and Decorating 5
8721560	Painting and Decorating 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in preparation of surfaces, application of coatings and coverings, scaffold and ladder erection, mixing and matching paints and application of wallpaper.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 6.0, Language 6.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 900 hours.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate the ability to work safely.
02. Select, use, and care for tools and equipment, scaffolding and ladders.
03. Demonstrate proficiency in the preparation of surfaces.
04. Demonstrate the use of the materials used in painting.
05. Demonstrate proper application of materials used in painting using brushes, rollers and sprayers.
06. Fit and apply wallpaper.
07. Mix colors and match samples.
08. Apply stains, varnishes, lacquers and acrylics.
09. Use chemical stripping and cleaning solutions.
10. Estimate costs and provide quotations.
11. Advise on the suitability of different materials.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARD

PROGRAM AREA: Industrial

PROGRAM TITLE: Painting and Decorating

EFFECTIVE DATE: July, 1987

SECONDARY NUMBER: 8721500

POSTSECONDARY NUMBER: BCT0160

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY--The student will be able to:

01.01 Explain the hazards of working above ground and appropriate work habits.
01.02 Explain and demonstrate safe use of hand and power tools.

02.0 SELECT, USE AND CARE FOR TOOLS AND EQUIPMENT, SCAFFOLDING AND LADDERS--The student will be able to:

02.01 Erect a scaffold.
02.02 Demonstrate proper use of folding and extension ladders.
02.03 Explain proper storage of flammable materials.
02.04 Explain and demonstrate proper cleaning and storage of tools and equipment.

03.0 DEMONSTRATE PROFICIENCY IN PREPARATION OF SURFACES--The student will be able to:

03.01 Prepare new wood surfaces for coating with paint.
03.02 Remove old wall coverings.
03.03 Prepare and seal walls for wallcoverings.
03.04 Prime plaster and sheetrock surfaces for painting.
03.05 Prepare metal surfaces for painting.
03.06 Use sandblasting equipment to remove old surface coatings.
03.07 Spackle/patch sheetrock and plaster surfaces.

04.0 DEMONSTRATE THE USE OF THE MATERIALS USED IN PAINTING--The student will be able to:

04.01 Explain the criteria for selection and use of water and chemical-based coatings.
04.02 Select brushes, roller covers and spray equipment for coatings to be used.

05.0 DEMONSTRATE PROPER APPLICATION OF MATERIALS USED IN PAINTING USING BRUSHES, ROLLERS, AND SPRAYERS--The student will be able to:

05.01 Paint a surface using a brush.
05.02 Paint trim with a brush.
05.03 Paint a surface with a roller.
05.04 Spray paint a surface.

06.0 FIT AND APPLY WALLPAPER--The student will be able to:

06.01 Select and mix paste (for non-prepasted) wall coverings.
06.02 Apply grass cloth wall covering.
06.03 Apply paper wall covering.
06.04 Apply foil wall covering.
06.05 Apply mylar wall covering.
06.06 Apply cloth backed wallcovering.
06.07 Match a pattern to a corner.
06.08 Fit wall paper around a window and door.

07.0 MIX COLORS AND MATCH SAMPLES--The student will be able to:

07.01 Identify fundamental colors.
07.02 Explain the process of mixing to arrive at custom colors or tints.
07.03 Mix paint to match a given sample.

08.0 APPLY STAINS, VARNISHES, LACQUERS AND FINISHES--The student will be able to:

08.01 Stain woodwork to a uniform color.
08.02 Stain wood to match a sample.
08.03 Seal wood for finishing.
08.04 Apply a varnish finish to a prepared wood surface.
08.05 Apply an oil finish to a prepared wood surface.
08.06 Apply a lacquer finish to a prepared wood surface.
08.07 Apply an acrylic finish to a prepared wood surface.

09.0 USE CHEMICAL STRIPPING AND CLEANING SOLUTIONS--The student will be able to:

09.01 Remove a finish from a painted surface using a chemical solution.
09.02 Use prepared solutions to clean a surface.
09.03 Apply rust inhibitors to metal surfaces.

10.0 ESTIMATE COST AND PROVIDE QUOTATIONS--The student will be able to:

10.01 Compute number of rolls of wallpaper required for a specified job.
10.02 Compute amount of paint for a specified job.

11.0 ADVISE ON SUITABILITY OF DIFFERENT MATERIALS--The student will be able to:

11.01 Select a suitable type of wallcovering based on surface of wall and environment.
11.02 Select a suitable type of coating based on surface, anticipated wear and environment.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Painting and Decorating

PROGRAM NUMBER: 8721500

COURSE TITLE: Painting and Decorating 1

COURSE NUMBER: 8721510

COURSE DESCRIPTION:

This course is designed to provide instruction in safe and proper use and care of related tools and equipment proper safety practices, the use storage and disposal materials.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY--The student will be able to:

01.01 Explain the hazards of working above ground and appropriate work habits.
01.02 Explain and demonstrate safe use of hand and power tools.

02.0 SELECT, USE AND CARE FOR TOOLS AND EQUIPMENT, SCAFFOLDING AND LADDERS--The student will be able to:

02.01 Erect a scaffold.
02.02 Demonstrate proper use of folding and extension ladders.
02.03 Explain proper storage of flammable materials.
02.04 Explain and demonstrate proper cleaning and storage of tools and equipment.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Painting and Decorating

PROGRAM NUMBER: 8721500

COURSE TITLE: Painting and Decorating 2

COURSE NUMBER: 8721520

COURSE DESCRIPTION:

This course is designed to provide instruction in the preparation of cleaning solutions, removal of finishes, surface preparation for painting, wallpapering, estimating costs, materials, quotation for specific jobs.

03.0 DEMONSTRATE PROFICIENCY IN PREPARATION OF SURFACES--The student will be able to:

03.01 Prepare new wood surfaces for coating with paint.
03.02 Remove old wall coverings.
03.03 Prepare and seal walls for wallcoverings.
03.04 Prime plaster and sheetrock surfaces for painting.
03.05 Prepare metal surfaces for painting.
03.06 Use sandblasting equipment to remove old surface coatings.
03.07 Spackle/patch sheetrock and plaster surfaces.

09.0 USE CHEMICAL STRIPPING AND CLEANING SOLUTIONS--The student will be able to:

09.01 Remove a finish from a painted surface using a chemical solution.
09.02 Use prepared solutions to clean a surface.
09.03 Apply rust inhibitors to metal surfaces.

10.0 ESTIMATE COST AND PROVIDE QUOTATIONS--The student will be able to:

10.01 Compute number of rolls of wallpaper required for a specified job.
10.02 Compute amount of paint for a specified job.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Painting and Decorating
PROGRAM NUMBER: 8721500
COURSE TITLE: Painting and Decorating 3
COURSE NUMBER: 8721530

COURSE DESCRIPTION:

This course is designed to provide instruction in the proper use and care of painting equipment, selection, mixing and application of materials used in painting.

04.0 DEMONSTRATE THE USE OF THE MATERIALS USED IN PAINTING--The student will be able to:

04.01 Explain the criteria for selection and use of water and chemical-based coatings.
04.02 Select brushes, roller covers and spray equipment for coatings to be used.

05.0 DEMONSTRATE PROPER APPLICATION OF MATERIALS USED IN PAINTING USING BRUSHES, ROLLERS, AND SPRAYERS--The student will be able to:

05.01 Paint a surface using a brush.
05.02 Paint trim with a brush.
05.03 Paint a surface with a roller.
05.04 Spray paint a surface.

07.0 MIX COLORS AND MATCH SAMPLES--The student will be able to:

07.01 Identify fundamental colors.
07.02 Explain the process of mixing to arrive at custom colors or tints.
07.03 Mix paint to match a given sample.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Painting and Decorating
PROGRAM NUMBER: 8721500
COURSE TITLE: Painting and Decorating 4
COURSE NUMBER: 8721540

COURSE DESCRIPTION:

This course is designed to provide instruction in the suitability of different materials used for covering walls, proper technique used in the layout cutting and fitting of wall paper.

11.0 ADVISE ON SUITABILITY OF DIFFERENT MATERIALS--The student will be able to:

11.01 Select a suitable type of wallcovering based on surface of wall and environment.
11.02 Select a suitable type of coating based on surface, anticipated wear and environment.

06.0 FIT AND APPLY WALLPAPER--The student will be able to:

06.01 Select and mix paste (for non-prepasted) wall coverings.
06.02 Apply grass cloth wall covering.
06.03 Apply paper wall covering.
06.04 Apply foil wall covering.
06.05 Apply mylar wall covering.
06.06 Apply cloth backed wallcovering.
06.07 Match a pattern to a corner.
06.08 Fit wall paper around a window and door.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Painting and Decorating
PROGRAM NUMBER: 8721500

COURSE TITLE: Painting and Decorating 5
COURSE NUMBER: 8721550

COURSE DESCRIPTION:

This course is designed to provide instruction in the preparation of surfaces for finishes, the selection, mixing and application of stains, varnishes, lacquers and finishes.

08.0 APPLY STAINS, VARNISHES, LACQUERS AND FINISHES--The student will be able to:

08.01 Stain woodwork to a uniform color.
08.02 Stain wood to match a sample.
08.03 Seal wood for finishing.
08.04 Apply a varnish finish to a prepared wood surface.
08.05 Apply an oil finish to a prepared wood surface.
08.06 Apply a lacquer finish to a prepared wood surface.
08.07 Apply an acrylic finish to a prepared wood surface.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Painting and Decorating
PROGRAM NUMBER: 8721500

COURSE TITLE: Painting and Decorating 6
COURSE NUMBER: 8721560

COURSE DESCRIPTION:

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Photographic Technology

CODE NUMBER: Secondary ______ Postsecondary GRA0995

Florida CIP IN10.010300

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational x Other 13-15

CERTIFICATION COVERAGE: PRINTING 7 TEC CONSTR @ 7 PHOTOG 7
BLDG CONST @ 7 TEC ELEC @ 7 TV PRO TEC 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as photographers (10221801), photo lab technicians, portrait photographers, medical photographers, photo journalists, photo lab managers, or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, using film, cameras, chemicals, photographic papers, laboratory practices, photographic equipment, and technical recording and reporting.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the tools, test equipment, materials and processes used in the photography program similar to those used in industry. Students should be able to use the various types of precision equipment found in general use throughout the photography industry for the purpose of photographing, processing and presenting photography.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 2150 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform laboratory skills.
02. Control exposures (35mm camera).
03. Take basic photographs (35mm camera).
04. Operate various format cameras.
05. Finish photographs.
06. Apply lighting techniques.

07. Take studio photographs.
08. Reproduce photographic media.
09. Process color film.
10. Print color photographs.
11. Produce media presentations.
12. Demonstrate competencies required to manage a photographic business.
13. Take photographs for news media.
14. Apply quality control.
15. Demonstrate employability skills.
16. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education
SECONDARY NUMBER: ________
PROGRAM TITLE: Photographic Technology
POSTSECONDARY NUMBER: GRA0995

01.0 PERFORM LABORATORY SKILLS--The student will be able to:

- 01.01 Mix developers and other chemicals.
- 01.02 Hand-process black and white film.
- 01.03 Print black and white photographs.
- 01.04 Process black and white paper.
- 01.05 Process high contrast film.
- 01.06 Perform toning skills.
- 01.07 Produce pan masking.
- 01.08 Produce black and white print using automated processing.

02.0 CONTROL EXPOSURES--The student will be able to:

- 02.01 Set appropriate F-stops and shutter speeds.
- 02.02 Select appropriate film type.

03.0 TAKE BASIC PHOTOGRAPHS (35mm CAMERA)--The student will be able to:

- 03.01 Apply camera care and maintenance principles.
- 03.02 Compose photographs.
- 03.03 Take still photographs.
- 03.04 Take action photographs.

04.0 OPERATE VARIOUS FORMAT CAMERAS--The student will be able to:

- 04.01 Use 2¼ format camera.
- 04.02 Use view camera.
- 04.03 Use front screen projection system.
- 04.04 Use 8 X 10 format.

05.0 FINISH PHOTOGRAPHS--The student will be able to:

- 05.01 Mount photographs.
- 05.02 Mat/frame photographs.
- 05.03 Apply print retouching.
- 05.04 Apply color lacquer spray.
- 05.05 Apply photo enhancement.

06.0 APPLY LIGHTING TECHNIQUES--The student will be able to:

- 06.01 Take photographs with available light.
- 06.02 Take photographs with electronic strobe.
- 06.03 Take photographs with photo-flood lighting.
- 06.04 Take photographs with quartz lighting.
- 06.05 Take photographs with parabolic lighting.

07.0 TAKE STUDIO PHOTOGRAPHS--The student will be able to:

- 07.01 Take commercial photographs.
- 07.02 Take portraits.
- 07.03 Take industrial photographs.

08.0 REPRODUCE PHOTOGRAPHIC MEDIA--The student will be able to:

- 08.01 Copy prints.
- 08.02 Copy transparencies.
- 08.03 Make internegatives.
- 08.04 Make translite.
- 08.05 Make halftone print.
- 08.06 Identify and define color separation.

09.0 PROCESS COLOR FILM--The student will be able to:

- 09.01 Hand process color negatives and transparencies.
- 09.02 Process color negatives and transparencies with automation.
- 09.03 Mix color film chemistry and maintain replenishment.

10.0 PRINT COLOR PHOTOGRAPHS--The student will be able to:

- 10.01 Process color paper.
- 10.02 Print color negatives.

10.03 Print color negatives using color analyzer.
10.04 Mix color paper chemistry and maintain replenishment.
10.05 Print color transparencies.

11.0 PRODUCE MEDIA PRESENTATIONS--The student will be able to:

11.01 Prepare script for slide presentation.
11.02 Shoot slides for slide presentation.
11.03 Produce slide presentation.
11.04 Prepare script for video presentation.
11.05 Shoot video tapes.
11.06 Produce video presentation.
11.07 Prepare storyboard for slide presentation.
11.08 Record sound for slide presentation.
11.09 Record sound for video presentation.

12.0 DEMONSTRATE COMPETENCIES REQUIRED TO MANAGE A PHOTOGRAPHIC BUSINESS--The student will be able to:

12.01 Apply communication skills.
12.02 Apply human relations skills.
12.03 Set rates for photographic work.
12.04 Maintain shop records and files.
12.05 Develop effective advertising.
12.06 Maintain presentational portfolio.
12.07 Analyze potential market area.
12.08 Analyze and develop a marketing plan.
12.09 Perform cost analysis.
12.10 Prepare basic media release
12.11 Apply accounting techniques.

13.0 TAKE PHOTOGRAPHS FOR NEWS MEDIA--The student will be able to:

13.01 Identify photographers legal rights/responsibilities.
13.02 Identify rules/regulations of copyright.
13.03 Take photographs for news media.
13.04 Write captions for photos.
13.05 Identify special camera accessories.
13.06 Identify specialized optics for photojournalism.

14.0 APPLY QUALITY CONTROL--The student will be able to:

14.01 Run control strips.
14.02 Plot control results.
14.03 Graft processors performance.
14.04 Maintain pH control of chemistry.
14.05 Operate densimeter.

15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job interview.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make job changes appropriately.
15.09 Demonstrate acceptable employee health habits.

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Plastering

CODE NUMBER: Secondary ______ Postsecondary BCT0439

Florida CIP IN46.040900

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ______7-9 ______9-12 ______Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-17

CERTIFICATION COVERAGE: TEC CONSTR @ 7 TROWEL TR 7 BLDG CONST @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as plasterers (50022801), or to provide supplemental training for persons previously or currently employed in this occupation.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, mathematics, sketching, basic drafting, safety using scaffolds and ladders, preparation of surfaces and application of plaster and composition moldings.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the application of plaster finishes and moldings to architectural surfaces.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 450 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Read and interpret blueprints and schematics.
02. Identify and use materials and finishes.
03. Demonstrate proper use of tools, trestles, scaffolds and ladders.
04. Shape and apply moldings and cornices.
05. Make molds.
06. Apply plaster.
07. Align surfaces using plumb bob, straight edge and spirit level.
08. Create smooth finish surfaces.
09. Create decorative textures and special effects by spraying, brushing, troweling, stippling, or spattering small stones on surface.
10. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS

PLASTERING

01.0 READ AND INTERPRET BLUEPRINTS AND SCHEMATICS — The student will be able to:

01.01 Identify parts of a building components using a blueprint.
01.02 Recognize commonly used symbols on blueprints.
01.03 Produce finished surfaces in accordance to blueprints, or architect's drawings.

02.0 IDENTIFY AND USE MATERIALS AND FINISHES — The student will be able to:

02.01 Mix mortar.
02.02 Mix plaster to designated consistency.
02.03 Install driveit systems.
02.04 Apply hardcoat and puttycoat finishes.

03.0 DEMONSTRATE PROPER USE OF TOOLS, TRESTLES, SCAFFOLDS AND LADDERS — The student will be able to:

03.01 Erect scaffolds.
03.02 Work off hod ladder.
03.03 Use measurement instruments and tools to determine dimensions.
03.04 Roughen undercoat with scratcher to provide bond.

04.0 SHAPE AND APPLY MOLDING AND CORNICES — The student will be able to:

04.01 Strike excess plaster.
04.02 Apply plaster using trowel and pushes template over plaster.
04.03 Apply coat of plaster to wall and presses trim to position.
04.04 Mold and install ornamental plaster panels and trim.

05.0 MAKE MOLDS — The student will be able to:

05.01 Shape plaster using template.
05.02 Spread plaster with trowel when installing ornamental trim.

06.0 APPLY PLASTER — The student will be able to:

06.01 Apply scratch coat of plaster to metal or gypsum lath.
06.02 Apply brown coat of plaster to metal or gypsum lath
06.03 Apply finish coat of plaster to metal or gypsum lath.
06.04 Spread plaster over lath or masonry base using trowel.
06.05 Apply plaster to interior walls.
06.06 Apply plaster to ceilings.

07.0 ALIGN SURFACES USING PLUMB BOB, STRAIGHT EDGE AND SPIRIT LEVEL — The student will be able to:

07.01 Smooth plaster with darby and float to attain uniform thickness.
07.02 Install fiber cornerites.

08.0 CREATE SMOOTH FINISH SURFACES — The student will be able to:

08.01 Produce finished surfaces following instruction.
08.02 Produce finished surfaces using handtools and portable power tools.

09.0 CREATE DECORATIVE TEXTURES AND SPECIAL EFFECTS BY SPRAYING, BRUSHING, TROWELING, STIPPLING, OR SPATTERING SMALL STONES ON SURFACES

09.01 Apply plaster with spray gun.
09.02 Spatter surface with small stones to create decorative textures in finish.
09.03 Mark surface of coat with brush and trowel to create decorative textures in finish.
09.04 Produce textured finished surfaces following directions.

10.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS — The student will be able to:

10.01 List sources of job opening other than public or private employment agencies.
10.02 Write a letter of application for a job.
10.03 Prepare a vita, resume or personal fact sheet.
10.04 List factors to consider when applying for a job.
10.05 List ways of making contact with employers.

10.06 Identify documents which may be required when applying for a job interview.
10.07 Complete a job application form correctly.
10.08 Identify appropriate dress and grooming for a job interview.
10.09 Classify behaviors considered appropriate or inappropriate in a job interview situation.
10.10 Describe advantage to employerr and employees of being a productive worker.
10.11 Explain the purpose of supervision, self discipline and performance evaluation.
10.12 Identify appropriate response(s) to criticism from employer, supervisor or other employees.
10.13 List consequences of being absent frequently from the job.
10.14 List consequences of frequently arriving late for work.
10.15 List factors to consider when resigning from a job.
10.16 Write a letter of resignation.

CURRICULUM FRAMEWORK
PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION
EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Precision Machining

CODE NUMBER: Secondary ________
Postsecondary MTR0470

Florida CIP IN48.050300

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ____________

APPLICABLE LEVELS(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 13-17

CERTIFICATION COVERAGE: MACH SHOP 7 TOOL DIE @ 7 METAL WORK @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as machinists (600.280-022), filers (705.484-010), grinders (603.280-018), buffers (60.382-010), lay out workers (600.281-018), cut off saw operators (607.682-010), drill press operators (606.682-014), lathe operators (604.280-010), mill operators (605.685-030), E.D.M. operators (609.482-010), C.N.C. machine operators (609.662-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, shop math and blueprints, shaping metal parts to required size, bench work, precision measurement, layout, and inspection.

II. LABORATORY ACTIVITIES: Machine shop laboratory activities are an integral part of this course and include the set-up and operation of grinders, buffers, cut off saws, drill presses, lathes, milling machines, electrical discharge (E.D.M.) machines, and machines with computerized numerical controls.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 contact hours (2160 clock hours).

IV. INTENDED OUTCOMES: After sucessfully completing this program, the student will be able to:

01. Demonstrate proficiency in performing prerequisite machining skills.
02. Demonstrate proficiency in performing bench work skills.

03. Demonstrate proficiency in setting up and operating power saws.
04. Demonstrate proficiency in setting up and operating pedestal grinders.
05. Demonstrate proficiency in setting up and operating drill presses.
06. Demonstrate proficiency in setting up and operating lathes.
07. Demonstrate proficiency in setting up and operating milling machines.
08. Demonstrate proficiency in setting up and operating grinding machines.
09. Demonstrate proficiency in setting up and operating tool machines and cutters.
10. Demonstrate proficiency in applying computerized numerical control operations skills.
11. Demonstrate proficiency in setting up and operating EDM machines.
12. Demonstrate proficiency in setting up and operating heat treat furnaces.
13. Demonstrate employability skills.
14. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education
SECONDARY NUMBER: ________
PROGRAM TITLE: Precision Machining
POSTSECONDARY NUMBER: MTR0470

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING PREREQUISITE MACHINING SKILLS

--The student will be able to:

01.01 **Demonstrate Proficiency in Maintaining Immediate Work Area**
01.01 Dispose of scrap metal chips, shavings, trash and waste
01.02 Clean and maintain work areas affected by operations
01.03 Leave area in safe condition
01.04 Comply with shop safety rules and practices
01.05 Comply with shop operating rules and practices
01.06 Participate in "clean up" of work and shop areas
01.07 Maintain a clean and orderly shop
01.09 **Perform Mathematical Calculations**
01.10 Make job-related decimal and fraction calculations
01.11 Solve job-related problems by adding, subtracting, multiplying, and dividing numbers
01.12 Solve job-related problems using a hand-held calculator
01.13 Solve job-related problems using basic formulas
01.14 Solve job-related problems using basic geometry
01.15 Solve job-related problems using basic trigonometry
01.16 Measure a workpiece and compare measurements with blueprint specifications
01.17 Calculate the amount of material that should be removed to obtain correct limits for secondary operations
01.18 Solve job-related problems using mathematical handbooks, charts, and tables
01.19 Convert measurements from English to metric and from metric to English units
01.20 Determine the clearance, relief, and rake of cutting tools
01.21 Calculate machine speed and feed by using appropriate formulas
01.22 **Demonstrate Proficiency in Blueprint Reading and Machine Planning**
01.23 Interpret view concepts
01.24 Read lines
01.25 Apply principles of dimensioning
01.26 Apply principles of tolerance expressions
01.27 Read and interpret title blocks
01.28 Read and interpret change orders on working and assembly prints
01.29 Read and interpret abbreviations
01.30 Make shop sketches
01.31 Read and interpret blueprints, including geometric tolerancing
01.32 Determine and interpret reference information used in performing machine work
01.33 Perform layout for precision machine work by using layout instruments
01.34 Lay out radii and bolt hole circles
01.35 Inspect, remove, and replace manufactured parts that need repair or machine work
01.36 Select the most productive tool and tooling for a given operation
01.37 **Perform Measuring Operations**
01.38 Read and measure with rules and calipers
01.39 Read and measure with micrometers
01.40 Read and measure with vernier tools
01.41 Read and measure with dial indicators
01.42 Measure with surface plates
01.43 Read and measure with gauge blocks and adjustable gauges
01.44 Measure with sine bars
01.45 Take readings with hardness testers
01.46 Take readings with optical comparators
01.47 Inspect finished products
01.48 **Perform Maintenance On Machines and Tools**
01.49 Lubricate equipment parts
01.50 Clean and store hand tools, cutters, fixtures, jigs, and attachments
01.51 Inspect and repair hand tools
01.52 Inspect drive pulleys or belts
01.53 Select lubricants for machining operations
01.54 Inspect equipment for safe operational conditions
01.55 Store grinding wheels
01.56 Store precision tools

01.57 Inspect and adjust machine guards
01.58 Inspect work areas to assure a safe working environment

02.0 DEMONSTRATE PROFICIENCY IN PERFORMING BENCH WORK SKILLS--The student will be able to:

02.01 Cut materials by using hand hacksaws
02.02 Cut threads by using hand taps
02.03 Cut threads by using dies
02.04 Ream holes by using hand reamers
02.05 Hand-sharpen cutting tools by using abrasive stones
02.06 Hone and lap surfaces
02.07 Remove damaged screws and other hardware
02.08 Set up and use arbor press broaches
02.09 Deburr workpieces

03.0 DEMONSTRATE PROFICIENCY IN SETTING UP AND OPERATING POWER SAWS --The student will be able to:

03.01 Remove and replace saw blades
03.02 Select appropriate blades to perform given sawing operations
03.03 Select and set speeds and feeds for given sawing operations
03.04 Measure and cut off material using a power saw
03.05 Saw to scribed lines by using a metal band saw
03.06 Cut and weld band saw blades to insert for contour sawing
03.07 Set up and operate saws for angular cutting

04.0 DEMONSTRATE PROFICIENCY IN SETTING UP AND OPERATING PEDESTAL GRINDERS --The student will be able to:

04.01 Comply with safe and efficient practices
04.02 Identify the parts of the machine and explain their use
04.03 Set up support rests
04.04 Dress grinding wheels
04.05 Grind lathe tools to required angles
04.06 Sharpen drills

05.0 DEMONSTRATE PROFICIENCY IN SETTING UP AND OPERATING DRILL PRESSES --The student will be able to:

05.01 Identify the parts of the machine and explain their use
05.02 Identify and set the machine controls
05.03 Comply with safe and efficient work practices
05.04 Select the proper tooling
05.05 Set up and operate for hole work, center drill, drill, ream, counter-sink, counterbore, and power tapping
05.06 Set drill presses for proper feed and speed for specified operations

06.0 DEMONSTRATE PROFICIENCY IN SETTING UP AND OPERATING LATHES--The student will be able to:

06.01 Identify the parts of the machine and explain their use
06.02 Comply with general safe and efficient work practices
06.03 Measure stock
06.04 Set up an engine lathe
06.05 Secure tools, tool-holders, and fixtures or attachments
06.06 Select and set feeds and speeds
06.07 Set up lathes and face workpieces held in chucks
06.08 Rough-cut and finish-cut with lathes
06.09 Perform lathe filing to deburr parts
06.10 Align lathe centers using accurate methods
06.11 Drill holes with lathes
06.12 Countersink holes with lathes
06.13 Ream holes with lathes
06.14 Tap threads with lathes
06.15 Die-cut threads with lathes
06.16 Counterbore holes with lathes
06.17 Bore holes with lathes
06.18 Knurl parts with lathes
06.19 Cut external threads with lathes
06.20 Rechase threads with lathes
06.21 Cut internal threads with lathes

06.22 Set up and perform taper turning with taper attachments
06.23 Set up and perform taper turning with the compound
06.24 Cut internal tapered surfaces
06.25 Set up and operate tool post grinders
06.26 Perform contour, angular, or radii cuts with lathes
06.27 Set up and use follow- and steady-rests
06.28 Set up face plates and dogs

07.0 DEMONSTRATE PROFICIENCY IN SETTING UP AND OPERATING MILLING MACHINES --The student will be able to:

07.01 Identify the parts of the horizontal and vertical machine and explain their use
07.02 Comply with safe and efficient work practices
07.03 True up the head and align milling machine fixtures
07.04 Select and set feeds and speeds for milling work
07.05 Square up workpieces with a table vise
07.06 Perform end milling
07.07 Perform fly-cutting operations
07.08 Drill holes with milling machines
07.09 Perform reaming operations
07.10 Cut external keyways
07.11 Bore holes with milling machines
07.12 Perform form milling
07.13 Perform indexing operations using a dividing head
07.14 Set up and operate rotary tables
07.15 Mill cylindrical work
07.16 Mill an external radius
07.17 Mill an angle
07.18 Align milling machine attachments
07.19 Mill internal slots with a slotter and attachment
07.20 Perform cutting-off operations
07.21 Perform straddle milling operations on the horizontal mill
07.22 Set up and perform slab mill operations
07.23 Use an edge finder and wiggler
07.24 Use digital readouts

08.0 DEMONSTRATE PROFICIENCY IN SETTING UP AND OPERATING GRINDING MACHINES --The student will be able to:

08.01 Identify the parts of the machine and explain their use
08.02 Comply with safe and efficient work practices
08.03 Select the proper wheel
08.04 Inspect, balance, dress, and true, grinding wheels
08.05 Select and set feeds and speeds of power-feed grinders
08.06 Attach and align workpieces for grinding operations
08.07 Cut off or part workpieces with grinding machines
08.08 Set up and grind parallel flat surfaces
08.09 Set up and grind four sides square
08.10 Set up grinders to run workpieces between centers
08.11 Measure, inspect, and rework workpieces on grinding machines
08.12 Set up, grind, and sharpen preshaped lathe tools
08.13 Set up and use radius dressers
08.14 Set up and use angle plates
08.15 Operate cyclindrical grinders
08.16 Grind to a shoulder
08.17 Grind a taper
08.18 Set up and operate I/O grinders (optional)

09.0 DEMONSTRATE PROFICIENCY IN SETTING UP AND OPERATING TOOL MACHINES AND CUTTERS--The student will be able to:

09.01 Identify the parts of the machine and explain their use
09.02 Identify and select proper machine controls
09.03 Comply with safe and efficient work practices
09.04 Select proper work holding devices
09.05 Perform truing, dressing, and forming operations to blueprint specifications
09.06 Compute proper speeds
09.07 Sharpen an end mill
09.08 Sharpen a horizontal milling cutter

10.0 DEMONSTRATE PROFICIENCY IN APPLYING COMPUTERIZED NUMERICAL CONTROL OPERATIONS SKILLS--The student will be able to:

10.01 Identify the parts of the machine and explain their use
10.02 Identify and select proper machine controls
10.03 Comply with safe and efficient work practices
10.04 Write a basic program and apply basic programming skills
10.05 Select proper work holders
10.06 Select proper cutting tools
10.07 Machine parts to blueprint tolerances

11.0 DEMONSTRATE PROFICIENCY IN SETTING UP AND OPERATING EDM MACHINES --The student will be able to:

11.01 Identify the parts of the machine and explain their use
11.02 Identify and select proper machine controls
11.03 Comply with safe and efficient work practices
11.04 Select proper work holding devices
11.05 Select and use proper power supply settings
11.06 Select and use the proper electrode material and dielectric fluid
11.07 Calculate the proper electrode size for the operation to be performed

12.0 DEMONSTRATE PROFICIENCY IN SETTING UP AND OPERATING HEAT TREAT FURNACES --The student will be able to:

12.01 Identify the parts of the machine and explain their use
12.02 Identify and select proper machine controls
12.03 Comply with safe and efficient work practices
12.04 Select and identify proper heat treatment processes
12.05 Perform a basic heat treatment process to blueprint specifications

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

13.01 Conduct a job search
13.02 Secure information about a job
13.03 Identify documents that may be required when applying for a job
13.04 Complete a job application form correctly
13.05 Demonstrate competence in job interview techniques
13.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
13.07 Identify acceptable work habits
13.08 Demonstrate knowledge of how to make job changes appropriately
13.09 Demonstrate acceptable employee health habits

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship
14.02 Describe the importance of entrepreneurship to the American economy
14.03 List the advantages and disadvantages of business ownership
14.04 Identify the risks involved in ownership of a business
14.05 Identify the necessary personal characteristics of a successful entrepreneur
14.06 Identify the business skills needed to operate a small business efficiently and effectively

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Precision Metal Fabrication

CODE NUMBER: Secondary ______ Postsecondary MTR0210

Florida CIP IN48.050400

SECONDARY SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

___ Postsecondary Vocational x Other 13-17

CERTIFICATION COVERAGE: SHEET METAL 7 METAL WORK @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as metal fabricators-assemblers (809.281.-010) sheetmetal workers (804.281-010), layout workers (600.281-018), cutoff saw operators (607.682-010), drill press operators (606.362-010), welders (819.384-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, measurement and layout, planning and design, sheetmetal work, structural steel, welding, mechanical fasteners, metal properties, heat treating, metalworking tools, and employability skills.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in safe work practices, measuring and layout tools, bench metal operations, electric metal bonding operations, gas welding and cutting operations, sheetmetal operations, grinding and sharpening tools, and metal working machines.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1600 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate basic metal fabrication skills.
02. Demonstrate ability to read plans and drawings.
03. Use measuring and layout tools.
04. Describe metals and their properties.
05. Operate Metalworking machines.
06. Perform metal fabrication operations.
07. Perform gas welding and cutting operations.
08. Perform electric metal-bonding operations.
09. Demonstrate and practice employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial SECONDARY NUMBER: ____________

PROGRAM TITLE: Precision Metal Fabrication POSTSECONDARY NUMBER: MTR0210

01.0 DEMONSTRATE BASIC METAL FABRICATION SKILLS--The student will be able to:

01.01 Comply with safety rules & practices.
01.02 Maintain a clean & orderly shop.
01.03 Make job-related decimal & fraction calculations.
01.04 Solve job-related problems adding,subtracting, multiplying, & dividing numbers.
01.05 Solve job-related problems operating a hand-held calculator held calculator.
01.06 Solve job-related problems using mathematical handbooks, charts, & tables.
01.07 Use rulers & tape measures to measure work piece.
01.08 Compute feet, inches, and yards.
01.09 Use the ruler to measure objects to the nearest 1/32 inch.
01.10 Use the protractor to measure angles to nearest degree.
01.11 Use the protractor & triangles to draw angles.
01.12 Use a micrometer to measure to one thousandth of an inch.
01.13 Demonstrate proper use of material handling techniques.

02.0 DEMONSTRATE ABILITY TO READ PLANS AND DRAWINGS--The student will be able to:

02.01 Identify dimensions.
02.02 Identify lists of materials and specifications.
02.03 Identify section views/pictorial views.
02.04 Disassemble and assemble parts using an exploded view drawing.
02.05 Interpret blueprint.
02.06 Identify dimensioning of radii, round holes & chamfers.
02.07 Identify screw threads & bolt types.
02.08 Identify dimensional tolerances.
02.09 Identify metal fabrication symbols used in blueprints.

03.0 USE MEASURING AND LAYOUT TOOLS--The student will be able to:

03.01 Perform basic geometric construction.
03.02 Use marking gauges, center punches, scribes, surface gauges, squares, dividers, dial indicators, protractors, surfaceplates, depth gauges, circumference rules.
03.03 Develop patterns using parallel line, radial line and triangulation.
03.04 Make metal fabrication sketches.

04.0 DESCRIBE METALS AND THEIR PROPERTIES--The student will be able to:

04.01 Describe the steelmaking process.
04.02 Describe the differences between ferrous and nonferrous metals.
04.03 Describe casting, alloys, forging.
04.04 Identify metals such as galvanized iron & steel, aluminum stainless steel, sheetmetal, copper, brass.
04.05 Identify properties of the most common metals.
04.06 Identify and describe common gauges, shapes, and dimensions of purchased materials.

05.0 OPERATE METALWORKING MACHINES--The student will be able to:

05.01 Identify the purpose of various types of machine shop equipment.
05.02 Identify types of a drill press.
05.03 Operate a drill press utilizing the correct drilling speed.

05.04 Operate a band saw utilizing the correct cutting speed.
05.05 Demonstrate clamping devices for securing stock for drilling.
05.06 Identify types and sizes of drill bits.
05.07 Use portable power saw equipment.
05.08 Use a cutoff or power hacksaw.
05.09 Use electric & air utility grinders.
05.10 Sharpen drill bits.
05.11 Select proper type of abrasive wheels for grinding machines.

06.0 PERFORM METAL FABRICATION OPERATIONS--The student will be able to:

06.01 Fabricate metal, edges, and seams.
06.02 Use hand tools to cut, punch, and shear metal.
06.03 Form sheetmetal using a brake, a folder, rools, and a turning machine.
06.04 Join metals using a solder, rivets, and mechanical fasteners.

07.0 PERFORM GAS WELDING AND CUTTING OPERATIONS--The student will be able to:

07.01 Identify welding cylinders, regulators, hoses, pressure gauges, and torches.
07.02 Describe welding equipment safety procedures.
07.03 Demonstrate proper flame settings.
07.04 Demonstrate basic gas welding skills.
07.05 Demonstrate procedures for adjusting and operating the oxyacetylene cutting torch.
07.06 Demonstrate freehand and guide cutting of various metal thicknesses.
07.07 Set up and operate a plasma arc cutting machine.

08.0 PERFORM ELECTRIC METAL-BONDING OPERATIONS--The student will be able to:

08.01 Describe and demonstrate the spot and arc welding process.
08.02 Demonstrate basic procedures for safely adjusting and operating an arc welder, selecting a rod, safety, striking and maintaining an arc, welding in various positions, and clamping.
08.03 Set-up and operate a spot welder.
08.04 Explain and demonstrate the MIG welding process.
08.05 Apply basic procedures for safely adjusting, operating, cleaning, and maintaining MIG welding equipment.
08.06 Apply basic procedures for safely adjusting and operating a TIG welder, welding in various position, selecting proper tips, and choosing filler metal.

09.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents that may be required when applying for a job.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.

10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK

FLORIDA DEPARTMENT OF EDUCATION

PROGRAM AREA: Industrial

EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Printing

CODE NUMBER: Secondary 8739000

Postsecondary ____

Florida CIP IN48.022100

SECONDARY SCHOOL CREDITS 6

COLLEGE CREDITS ____

POSTSECONDARY ADULT VOCATIONAL CREDITS

APPLICABLE LEVELS(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 10-12, 21

CERTIFICATION COVERAGE: PRINTING 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment as trainees or operators with occupational titles such as typesetter (650.582-022), paste-up/mechanical assembler (970.381-018), lithographic-camera operator (972.382-014), stripper (971.381-050), plate maker (972.381-010), offset-press operator (651.685-018), bindery operator (653.685-010), or as helpers in these and other related job titles.

Graduates of this program may also be employed in related industries in various other occupational positions as trainees.

Graduates of this program will be prepared for further specialized training and education in Printing and Graphic Arts, Graphic Arts Technology, and other related technologies.

This program prepares individuals to set up, operate, and maintain preparation, printing, and binding equipment used in the printing industry.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, administrative support operations, pre-press operations, press operations, and finishing operations.

Listed below are the courses that comprise this program when offered at the secondary level:

8739010	Printing 1
8739020	Printing 2
8739030	Printing 3
8739040	Printing 4
8739050	Printing 5
8739060	Printing 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in tools, test equipment, and in operating equipment, materials, and processes similar to those used in the printing industry. Students should be exposed to the various types of equipment found in general use throughout the printing industry for the purpose of producing customer layouts, composition, and camera-ready copy; producing line negatives, halftone negatives, and contacts; stripping line negatives, halftone negatives, and multicolor and process-color negatives; producing single-color proofs and multicolor color proofs; producing printing plates; operating and adusting duplicators; and operating cutting, folding, and binding equipment.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and for reinforcing specific vocational skills.

When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever this cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills, and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student should be able to:

01. Demonstrate proficiency in performing clerical administrative support operations.
02. Demonstrate proficiency in performing mechanical/creative support operations.
03. Demonstrate proficiency in performing pre-press operations.
04. Demonstrate proficiency in performing offset press operations.
05. Demonstrate proficiency in performing finishing/binding operations.
06. Demonstrate employability skills.
07. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
PROGRAM AREA: Industrial
PROGRAM TITLE: Printing

EFFECTIVE DATE: July, 1987
SECONDARY NUMBER: 8739000
POSTSECONDARY NUMBER: ______

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING CLERICAL ADMINISTRATIVE SUPPORT OPERATIONS--The student will be able to:

01.01 Establish the sequence of job operations
01.02 Apply basic safety rules
01.03 Use printer's measurements to compute inches and fractions, points and picas, and decimals, percentages, and proportions
01.04 Use a job information jacket
01.05 Identify characteristics of printing papers to specify basic weights, sizes, and grades
01.06 Perform routine maintenance in accordance with manufacturers' specifications and established maintenance schedules
01.07 Comply with established waste and spoilage control measures

02.0 DEMONSTRATE PROFICIENCY IN PERFORMING MECHANICAL/CREATIVE SUPPORT OPERATIONS--The student will be able to:

02.01 Identify the equipment, tools, and materials used in design and copy preparation and the safety rules pertaining to each
02.02 Prepare thumbnail layouts
02.03 Prepare rough layouts
02.04 Prepare comprehensive layouts including a finished working dummy
02.05 Size and proportion photographs, line drawings, and other copy elements
02.06 Copyfit and mark up (specific type sizes and styles)
02.07 Prepare computer typesetting equipment for operation
02.08 Operate typesetting equipment
02.09 Prepare typesetting processor
02.10 Process typeset copy
02.11 Proofread typeset output
02.12 Paste up mechanical elements including keyline for photographs and tint blocks; and ruling
02.13 Prepare tissue overlays and specify color break, tint percentages, and reverses
02.14 Check and compare completed mechanicals to comprehensive layouts for final proofing

03.0 DEMONSTRATE PROFICIENCY IN PERFORMING PRE-PRESS OPERATIONS--The student will be able to:

03.01 Identify the equipment and materials used in reproduction photography and the safety rules pertaining to each
03.02 Apply basic principles of photosensitometry, orthochromatic, and panchromatic (including use of the gray scale)
03.03 Apply basic principles of light pertaining to copy board illumination and exposure calculations for all camera functions
03.04 Apply basic principles of camera optics as pertains to exposure control, focus, and camera extensions pertaining to reductions and enlargements
03.05 Identify the parts of the process camera and explain their use
03.06 Apply basic principles of darkroom chemistry
03.07 Prepare darkroom chemistry
03.08 Establish basic line exposure at 100 percent using standard time and temperature development
03.09 Apply basic principles of a Kodak halftone computer and density guide
03.10 Establish basic exposures to determine screen range, basic flash, main exposure, and bump exposure at 100 percent using standard time and temperature development
03.11 Produce line negatives to size
03.12 Inspect and evaluate line negatives to the original mechanical
03.13 Produce halftones to size
03.14 Inspect and evaluate halftones to the original copy
03.15 Make line and halftone diffusion transfer prints
03.16 Inspect and evaluate prints to the original mechanical
03.17 Apply basic principles of additive and subtractive color pertaining to the use of filters
03.18 Use filters to hold/delete colors on line shots at 100 percent using standard time and temperature development

03.19 Identify the parts of a contact frame and light source and explain their use
03.20 Produce contacts using orthochromatic and duplicating film using a transmission density guide and standard time and temperature development
03.21 Identify equipment and materials used in the stripping function and the safety rules pertaining to each
03.22 Apply basic principles of stripping using: a T-square and triangle to align, position, and tape film (emulsion side up) on rules or unruled plastic or paper masking sheets; open windows; and opaque on the emulsion side
03.23 Strip 1-color, 1-up layouts
03.24 Strip 1-color, multiple layouts
03.25 Strip 1-color, step layouts
03.26 Strip 1-color, 4-page layouts
03.27 Strip 1-color, 8-page layouts
03.28 Strip multiple-burn layouts (halftone and screen tints)
03.29 Strip multiple flat-color layouts
03.30 Inspect and evaluate flats to the original mechanicals
03.31 Identify equipment and materials used in proofing and platemaking to obtain proper exposures using a transmission density guide for processing photosensitive additive or subtractive paper or metal plates
03.32 Produce proofs on diazo or silver paper
03.33 Process proofs
03.34 Inspect and evaluate proofs to the original mechanicals
03.35 Produce additive or subtractive paper or metal plates
03.36 Process plates
03.37 Inspect and evaluate plates to proofs
03.38 File, handle, and retrieve flats and plates

04.0 DEMONSTRATE PROFICIENCY IN PERFORMING OFFSET PRESS OPERATIONS
--The student will be able to:

04.01 Identify the equipment and materials used in offset press operations, their parts and functions, and the safety rules relating to their operation
04.02 Apply basic principles of offset lithography pertaining to physical and chemical properties of ink components (pigment, vehicle, and dryer)
04.03 Apply basic principles of offset lithography pertaining to dampening systems (ducted and continuous)
04.04 Apply basic principles of offset lithography pertaining to fountain solutions chemical components (acid, alkaline, and neutral)
04.05 Apply basic principles of offset lithography pertaining to pH control and its effects on the lithographic process
04.06 Apply basic principles of offset lithography pertaining to interrelationships upon the process of paper (coated and uncoated and various grades within)
04.07 Apply basic principles of offset lithography pertaining to the interrelationships of textured or smooth paper; paper, plastic, or metal plates; and conventional or compressible blankets
04.08 Apply basic principles of offset lithography pertaining to ink and its drying properties in relation to fountain solution, plate and paper used (including effects of ink film thickness and drying time and set off, and problems associated with inappropriate use of spray powder)
04.09 Apply basic principles of plate preservation after presswork for long-term storage (use of gum arabic and asphaltum)
04.10 Prepare presses for operation by reviewing job-ticket specifications and then selecting appropriate press and materials
04.11 Prepare presses for operation based on the interrelationships of the lithographic process
04.12 Mix fountain solution from concentrate
04.13 Mix ink to PMS (Pantone Matching System) specifications
04.14 Introduce ink and fountain solution to presses in the proper sequence
04.15 Set up and adjust feeders to paper specifications (air blast, vacuum, and choke)
04.16 Set up and adjust register systems to single sheet or stream fed, side guide, and head register
04.17 Set up and adjust delivery (chute or chain)

04.18 Mount plates (pack if necessary) and adjust to press specifications
04.19 Mount blankets (pack if necessary) and adjust to press specifications
04.20 Set impression cylinders to paper thickness and press specifications
04.21 Set and adjust ink and water rollers pressures to press specifications
04.22 Make-ready presses to assure ink and water balance for uniform coverage, volume and replenishment of ink, image position, cylinder pressure, and sheet registration
04.23 Inspect and evaluate final make-ready sheets to job-ticket
04.24 Set spray powder
04.25 Produce the required number of press sheets to job-ticket specifications
04.26 Preserve plates for long-term storage
04.27 Perform press wash-up
04.28 Perform routine press maintenance to manufacturers' specifications

05.0 DEMONSTRATE PROFICIENCY IN PERFORMING FINISHING/BINDING OPERATIONS

--The student will be able to:

05.01 Identify the equipment and materials used in finsihing/binding operations, their parts and functions, and the safety rules relating to their operation
05.02 Apply basic principles of finishing/binding operations pertaining to pre-press paper cutting, post-press paper cutting and post-bindery cutting (after folding, stitching, etc.)
05.03 Apply basic principles of finishing/binding operations pertaining to sheet cutting
05.04 Apply basic principles of finishing/binding operations pertaining to grain, caliper, and finish (coated or uncoated) of paper
05.05 Apply basic principles of finishing/binding operations pertaining to signature configurations
05.06 Apply basic principles of finishing/binding operations pertaining to knife and buckle folding
05.07 Apply basic principles of finishing/binding operations pertaining to scoring and perforating
05.08 Apply basic principles of finishing/binding operations pertaining to collating and gathering
05.09 Apply basic principles of finishing/binding operations pertaining to binding alternatives (saddle, side, perfect, comb, spiral, case, etc.)
05.10 Apply basic principles of finishing/binding operations pertaining to adhesive binding (padding and fan-apart)
05.11 Apply basic principles of finishing/binding operations pertaining to packaging and identification
05.12 Demonstrate methods of counting sheets (machine, measurement, weight, and rapid multiple-sheet manual counting by fives, etc.)
05.13 Hand-jog 8 1/2" x 11" sheets
05.14 Hand-jog 17" x 22" sheets--or larger sheets
05.15 Machine-jog sheets
05.16 Prepare rule-outs of press sheets for finishing operations according to job-ticket specifications and approved proofs
05.17 Set up and operate cutters in accordance with rule-outs
05.18 Prepare a folding dummy from press sheets in accordance with job-ticket specifications and approved proofs
05.19 Set up and operate folders in accordance with job-ticket specifications and the folding dummy
05.20 Make a single fold
05.21 Make a multiple parallel fold
05.22 Make a right-angle fold
05.23 Identify and define slitting, perforating, and scoring functions pertaining to folding operations
05.24 Define collating flat sheets
05.25 Define gathering of signatures
05.26 Set up and operate stitchers (side- and saddle-)
05.27 Set up and operate comb binding machines
05.28 Perform paper padding functions
05.29 Define perfect, spiral, and case binding
05.30 Set up and operate a paper drill for a standard loose-leaf binder
05.31 Define die-cutting, embossing, foil-stamping, and numbering

05.32 Package and identify a completed job according to job-ticket specifications including description and/or sample, quantity per package and number of packages, customer purchase order number, and job number

06.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

06.01 Conduct a job search
06.02 Secure information about a job
06.03 Identify documents that may be required when applying for a job
06.04 Complete a job application form correctly
06.05 Demonstrate competence in job interview techniques
06.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
06.07 Identify acceptable work habits
06.08 Demonstrate knowledge of how to make job changes appropriately
06.09 Demonstrate acceptable employee health habits

07.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

07.01 Define entrepreneurship.
07.02 Describe the importance of entrepreneurship to the American economy.
07.03 List the advantages and disadvantages of business ownership.
07.04 Identify the risks involved in ownership of a business.
07.05 Identify the necessary personal characteristics of a successful entrepreneur.
07.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Printing

PROGRAM NUMBER: 8739000

COURSE TITLE: Printing 1

COURSE NUMBER: 8739010

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing clerical administrative support operations.

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING CLERICAL ADMINISTRATIVE SUPPORT OPERATIONS--The student will be able to:

01.01 Establish the sequence of job operations
01.02 Apply basic safety rules
01.03 Use printer's measurements to compute inches and fractions, points and picas, and decimals, percentages, and proportions
01.04 Use a job information jacket
01.05 Identify characteristics of printing papers to specify basic weights, sizes, and grades
01.06 Perform routine maintenance in accordance with manufacturers' specifications and established maintenance schedules
01.07 Comply with established waste and spoilage control measures

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STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Printing

PROGRAM NUMBER: 8739000

COURSE TITLE: Printing 2

COURSE NUMBER: 8739020

COURSE DESCRIPTION:

This course is designed to provide instruction for performing mechanical/creative support operations.

02.0 DEMONSTRATE PROFICIENCY IN PERFORMING MECHANICAL/CREATIVE SUPPORT OPERATIONS--The student will be able to:

02.01 Identify the equipment, tools, and materials used in design and copy preparation and the safety rules pertaining to each
02.02 Prepare thumbnail layouts
02.03 Prepare rough layouts
02.04 Prepare comprehensive layouts including a finished working dummy
02.05 Size and proportion photographs, line drawings, and other copy elements
02.06 Copyfit and mark up (specific type sizes and styles)
02.07 Prepare computer typesetting equipment for operation
02.08 Operate typesetting equipment
02.09 Prepare typesetting processor
02.10 Process typeset copy
02.11 Proofread typeset output
02.12 Paste up mechanical elements including keyline for photographs and tint blocks; and ruling
02.13 Prepare tissue overlays and specify color break, tint percentages, and reverses
02.14 Check and compare completed mechanicals to comprehensive layouts for final proofing

STUDENT PERFORMANCE STANDARDS
PROGRAM AREA: Industrial
PROGRAM TITLE: Printing
COURSE TITLE: Printing 3

EFFECTIVE DATE: July, 1987
COURSE CREDIT: 1
PROGRAM NUMBER: 8739000
COURSE NUMBER: 8739030

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing pre-press operations.

03.0 DEMONSTRATE PROFICIENCY IN PERFORMING PRE-PRESS OPERATIONS--The student will be able to:

03.01 Identify the equipment and materials used in reproduction photography and the safety rules pertaining to each
03.02 Apply basic principles of photosensitometry, orthochromatic, and panchromatic (including use of the gray scale)
03.03 Apply basic principles of light pertaining to copy board illumination and exposure calculations for all camera functions
03.04 Apply basic principles of camera optics as pertains to exposure control, focus, and camera extensions pertaining to reductions and enlargements
03.05 Identify the parts of the process camera and explain their use
03.06 Apply basic principles of darkroom chemistry
03.07 Prepare darkroom chemistry
03.08 Establish basic line exposure at 100 percent using standard time and temperature development
03.09 Apply basic principles of a Kodak halftone computer and density guide
03.10 Establish basic exposures to determine screen range, basic flash, main exposure, and bump exposure at 100 percent using standard time and temperature development
03.11 Produce line negatives to size
03.12 Inspect and evaluate line negatives to the original mechanical
03.13 Produce halftones to size
03.14 Inspect and evaluate halftones to the original copy
03.15 Make line and halftone diffusion transfer prints
03.16 Inspect and evaluate prints to the original mechanical
03.17 Apply basic principles of additive and subtractive color pertaining to the use of filters
03.18 Use filters to hold/delete colors on line shots at 100 percent using standard time and temperature development
03.19 Identify the parts of a contact frame and light source and explain their use
03.20 Produce contacts using orthochromatic and duplicating film using a transmission density guide and standard time and temperature development
03.21 Identify equipment and materials used in the stripping function and the safety rules pertaining to each
03.22 Apply basic principles of stripping using: a T-square and triangle to align, position, and tape film (emulsion side up) on rules or unruled plastic or paper masking sheets; open windows; and opaque on the emulsion side
03.23 Strip 1-color, 1-up layouts
03.24 Strip 1-color, multiple layouts
03.25 Strip 1-color, step layouts
03.26 Strip 1-color, 4-page layouts
03.27 Strip 1-color, 8-page layouts
03.28 Strip multiple-burn layouts (halftone and screen tints)
03.29 Strip multiple flat-color layouts
03.30 Inspect and evaluate flats to the original mechanicals
03.31 Identify equipment and materials used in proofing and platemaking to obtain proper exposures using a transmission density guide for processing photosensitive additive or subtractive paper or metal plates
03.32 Produce proofs on diazo or silver paper
03.33 Process proofs
03.34 Inspect and evaluate proofs to the original mechanicals
03.35 Produce additive or subtractive paper or metal plates
03.36 Process plates

Printing 3 - Continued

03.37 Inspect and evaluate plates to proofs
03.38 File, handle, and retrieve flats and plates

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1987
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Printing	PROGRAM NUMBER:	8739000
COURSE TITLE:	Printing 4	COURSE NUMBER:	8739040

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing offset press operations.

04.0 DEMONSTRATE PROFICIENCY IN PERFORMING OFFSET PRESS OPERATIONS
--The student will be able to:

04.01 Identify the equipment and materials used in offset press operations, their parts and functions, and the safety rules relating to their operation
04.02 Apply basic principles of offset lithography pertaining to physical and chemical properties of ink components (pigment, vehicle, and dryer)
04.03 Apply basic principles of offset lithography pertaining to dampening systems (ducted and continuous)
04.04 Apply basic principles of offset lithography pertaining to fountain solutions chemical components (acid, alkaline, and neutral)
04.05 Apply basic principles of offset lithography pertaining to pH control and its effects on the lithographic process
04.06 Apply basic principles of offset lithography pertaining to interrelationships upon the process of paper (coated and uncoated and various grades within)
04.07 Apply basic principles of offset lithography pertaining to the interrelationships of textured or smooth paper; paper, plastic, or metal plates; and conventional or compressible blankets
04.08 Apply basic principles of offset lithography pertaining to ink and its drying properties in relation to fountain solution, plate and paper used (including effects of ink film thickness and drying time and set off, and problems associated with inappropriate use of spray powder)
04.09 Apply basic principles of plate preservation after presswork for long-term storage (use of gum arabic and asphaltum)
04.10 Prepare presses for operation by reviewing job-ticket specifications and then selecting appropriate press and materials
04.11 Prepare presses for operation based on the interrelationships of the lithographic process
04.12 Mix fountain solution from concentrate
04.13 Mix ink to PMS (Pantone Matching System) specifications
04.14 Introduce ink and fountain solution to presses in the proper sequence
04.15 Set up and adjust feeders to paper specifications (air blast, vacuum, and choke)
04.16 Set up and adjust register systems to single sheet or stream fed, side guide, and head register
04.17 Set up and adjust delivery (chute or chain)
04.18 Mount plates (pack if necessary) and adjust to press specifications
04.19 Mount blankets (pack if necessary) and adjust to press specifications
04.20 Set impression cylinders to paper thickness and press specifications
04.21 Set and adjust ink and water rollers pressures to press specifications
04.22 Make-ready presses to assure ink and water balance for uniform coverage, volume and replenishment of ink, image position, cylinder pressure, and sheet registration

Printing 4 - Continued

04.23 Inspect and evaluate final make-ready sheets to job-ticket
04.24 Set spray powder
04.25 Produce the required number of press sheets to job-ticket specifications
04.26 Preserve plates for long-term storage
04.27 Perform press wash-up
04.28 Perform routine press maintenance to manufacturers' specifications

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STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Printing

PROGRAM NUMBER: 8739000

COURSE TITLE: Printing 5

COURSE NUMBER: 8739050

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing finishing/binding.

05.0 DEMONSTRATE PROFICIENCY IN PERFORMING FINISHING/BINDING OPERATIONS --The student will be able to:

05.01 Identify the equipment and materials used in finsihing/binding operations, their parts and functions, and the safety rules relating to their operation
05.02 Apply basic principles of finishing/binding operations pertaining to pre-press paper cutting, post-press paper cutting and post-bindery cutting (after folding, stitching, etc.)
05.03 Apply basic principles of finishing/binding operations pertaining to sheet cutting
05.04 Apply basic principles of finishing/binding operations pertaining to grain, caliper, and finish (coated or uncoated) of paper
05.05 Apply basic principles of finishing/binding operations pertaining to signature configurations
05.06 Apply basic principles of finishing/binding operations pertaining to knife and buckle folding
05.07 Apply basic principles of finishing/binding operations pertaining to scoring and perforating
05.08 Apply basic principles of finishing/binding operations pertaining to collating and gathering
05.09 Apply basic principles of finishing/binding operations pertaining to binding alternatives (saddle, side, perfect, comb, spiral, case, etc.)
05.10 Apply basic principles of finishing/binding operations pertaining to adhesive binding (padding and fan-apart)
05.11 Apply basic principles of finishing/binding operations pertaining to packaging and identification
05.12 Demonstrate methods of counting sheets (machine, measurement, weight, and rapid multiple-sheet manual counting by fives, etc.)
05.13 Hand-jog 8 1/2" x 11" sheets
05.14 Hand-jog 17" x 22" sheets--or larger sheets
05.15 Machine-jog sheets
05.16 Prepare rule-outs of press sheets for finishing operations according to job-ticket specifications and approved proofs
05.17 Set up and operate cutters in accordance with rule-outs
05.18 Prepare a folding dummy from press sheets in accordance with job-ticket specifications and approved proofs
05.19 Set up and operate folders in accordance with job-ticket specifications and the folding dummy
05.20 Make a single fold
05.21 Make a multiple parallel fold
05.22 Make a right-angle fold
05.23 Identify and define slitting, perforating, and scoring functions pertaining to folding operations
05.24 Define collating flat sheets
05.25 Define gathering of signatures

05.26 Set up and operate stitchers (side- and saddle-)
05.27 Set up and operate comb binding machines
05.28 Perform paper padding functions
05.29 Define perfect, spiral, and case binding
05.30 Set up and operate a paper drill for a standard loose-leaf binder
05.31 Define die-cutting, embossing, foil-stamping, and numbering
05.32 Package and identify a completed job according to job-ticket specifications including description and/or sample, quantity per package and number of packages, customer purchase order number, and job number

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STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1987
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Printing	PROGRAM NUMBER:	8739000
COURSE TITLE:	Printing 6	COURSE NUMBER:	8739060

COURSE DESCRIPTION:

This course is designed to provide instruction in the demonstration of employability skills.

06.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

06.01 Conduct a job search
06.02 Secure information about a job
06.03 Identify documents that may be required when applying for a job
06.04 Complete a job application form correctly
06.05 Demonstrate competence in job interview techniques
06.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
06.07 Identify acceptable work habits
06.08 Demonstrate knowledge of how to make job changes appropriately
06.09 Demonstrate acceptable employee health habits

07.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

07.01 Define entrepreneurship.
07.02 Describe the importance of entrepreneurship to the American economy.
07.03 List the advantages and disadvantages of business ownership.
07.04 Identify the risks involved in ownership of a business.
07.05 Identify the necessary personal characteristics of a successful entrepreneur.
07.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK — PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION — EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Printing and Graphic Arts

CODE NUMBER: Secondary ______ Postsecondary GRA0996

Florida CIP IN48.020100

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVELS(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 13-17

CERTIFICATION COVERAGE: PRINTING 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment as proofreaders (209.387-030), cutting-machine operators (640.682-018), typesetters (650.582-022), single-color sheet-fed press operators (615.482-010), duplicator operators (651.682-014), folding-machine operators (653.382-010), bindery operators (653.685-010), paste-up/mechanical assemblers (970.381-018), contact printers (971.382-014), strippers (971.381-050), plate makers (972.381-010), and lithographic-camera operators or helpers (972.382-014), or to provide supplemental training for persons previously or currently employed in these occupations.

This program prepares individuals to set up, operate, and maintain preparation, printing, and binding equipment used in the printing industry. Graduates of this program may be employed in related industries in various other occupational positions as trainees. Graduates of this program will also be prepared for further specialized training and education in Graphic Arts Technology and other related technologies. This program may also serve as apprenticeship-related instruction and qualify individuals for advanced standing in apprenticeship training programs.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, administrative support operations, pre-press operations, press operations, and finishing operations.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in tools, test equipment, operating equipment, materials, and processes similar to those used in the printing industry. Students should be able to use the various types of equipment found in general use throughout the printing industry to produce customer layouts, compositions, and camera-ready copy; to produce line negatives, halftone negatives, and contacts; to strip line negatives, halftone negatives, and multicolor and process-color negatives; to produce printing plates, single color proofs, and multicolor color proofs; to operate and adjust duplicators; and to operate cutting, folding, and binding equipment.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills, and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 contact hours (2160 clock hours).

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in performing clerical administrative support operations.
02. Demonstrate proficiency in performing mechanical creative support operations.
03. Demonstrate proficiency in performing pre-press operations.
04. Demonstrate proficiency in performing offset press operations.
05. Demonstrate proficiency in performing finishing/binding operations.
06. Demonstrate the ability to perform laboratory projects to industry standards.
07. Demonstrate employability skills.
08. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Printing and Graphic Arts POSTSECONDARY NUMBER: GRA0996

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING CLERICAL ADMINISTRATIVE SUPPORT OPERATIONS--The student will be able to:

01.01 Establish sequence of job operations
01.02 Apply basic safety rules
01.03 Use printer's measurements to compute inches and fractions; points and picas; and decimals, percentages, and proportions
01.04 Use job information jacket
01.05 Identify characteristics of printing papers to specify basic weights, sizes, and grades
01.06 Perform routine maintenance in accordance with manufacturers' specifications and established maintenance schedule
01.07 Comply with established waste and spoilage control measures

02.0 DEMONSTRATE PROFICIENCY IN PERFORMING MECHANICAL CREATIVE SUPPORT OPERATIONS--The student will be able to:

02.01 Identify the equipment, tools, and materials used in design and copy preparation and the safety rules pertaining to each
02.02 Prepare thumbnail layout
02.03 Prepare rough layout
02.04 Prepare comprehensive layout including finished working dummy
02.05 Size and proportion photographs, line drawings, and other copy elements
02.06 Copyfit and mark up (specify type sizes and styles)
02.07 Prepare computer typesetting equipment for operation
02.08 Operate typesetting equipment
02.09 Prepare typesetting processor
02.10 Process typeset copy
02.11 Proofread typeset output
02.12 Paste up mechanical elements including keyline for photographs and tint blocks; and ruling
02.13 Prepare tissue overlay and specify color break, tint percentages, and reverses
02.14 Check and compare completed mechanical to comprehensive layout for final proofing

03.0 DEMONSTRATE PROFICIENCY IN PERFORMING PRE-PRESS OPERATIONS--The student will be able to:

03.01 Identify the equipment and materials used in reproduction photography and the safety rules pertaining to each
03.02 Apply basic principles of photosensitometry, orthochromatic, and panchromatic (including use of gray scale)
03.03 Apply basic principles of light pertaining to copy board illumination and exposure calculations for all camera functions
03.04 Apply basic principles of camera optics pertaining to exposure control, focus, and camera extensions as related to reductions and enlargements
03.05 Identify the parts of the process camera and explain their use
03.06 Apply basic principles of darkroom chemistry
03.07 Prepare darkroom chemistry
03.08 Establish basic line exposure at 100 percent using standard time and temperature development
03.09 Apply basic principles of Kodak halftone computer and density guide
03.10 Establish basic exposures to determine screen range, basic flash, main exposure, and bump exposure at 100 percent using standard time and temperature development
03.11 Produce line negatives to size
03.12 Inspect and evaluate line negatives to original mechanical
03.13 Produce halftones to size
03.14 Inspect and evaluate halftones to original copy
03.15 Make line and halftone diffusion transfer prints
03.16 Inspect and evaluate prints to original mechanical
03.17 Apply basic principles of additive and subtractive color pertaining to the use of filters
03.18 Use filters to hold/delete colors on line shots at 100 percent using standard time and temperature development

03.19 Identify the parts of a contact frame and light source and explain their use
03.20 Produce contacts using orthochromatic and duplicating film using transmission density guide and standard time and temperature development
03.21 Identify equipment and materials used in the stripping function and the safety rules pertaining to each
03.22 Apply basic principles of stripping using: T-square and triangle to align, position, and tape film (emulsion side up) on ruled or unruled plastic or paper masking sheets; open windows; and opaque on the emulsion side
03.23 Strip 1-color, 1-up layout
03.24 Strip 1-color, multiple layout
03.25 Strip 1-color, step layout
03.26 Strip 1-color, 4-page layout
03.27 Strip 1-color, 8-page layout
03.28 Strip multiple-burn layout (halftone and screen tints)
03.29 Strip multiple flat-color layout
03.30 Inspect and evaluate flats to original mechanical
03.31 Identify equipment and materials used in proofing and platemaking to obtain proper exposures using a transmission density guide for processing photosensitive additive or subtractive paper or metal plates
03.32 Produce proofs on diazo or silver paper
03.33 Process proofs
03.34 Inspect and evaluate proofs to original mechanical
03.35 Produce additive or subtractive paper or metal plates
03.36 Process plates
03.37 Inspect and evaluate plates to proofs
03.38 File, handle, and retrieve flats and plates

04.0 DEMONSTRATE PROFICIENCY IN PERFORMING OFFSET PRESS OPERATIONS--The student will be able to:

04.01 Identify the equipment and materials used in offset press operations, their parts and functions, and the safety rules relating to their operation
04.02 Apply basic principles of offset lithography pertaining to physical and chemical properties of ink components (pigment, vehicle, and dryer)
04.03 Apply basic principles of offset lithography pertaining to dampening systems (ducted and continuous)
04.04 Apply basic principles of offset lithography pertaining to fountain solutions' chemical components (acid, alkaline, and neutral)
04.05 Apply basic principles of offset lithography pertaining to pH control and its effects on the lithographic process
04.06 Apply basic principles of offset lithography pertaining to interrelationships upon the process of paper (coated and uncoated and various grades within)
04.07 Apply basic principles of offset lithography pertaining to the interrelationships of textured or smooth paper; paper, plastic, metal plates; and conventional or compressible blankets
04.08 Apply basic principles of offset lithography pertaining to ink and its drying properties in relation to fountain solution, plate and paper used (including effects of ink film thickness and drying time and set off, and problems associated with inappropriate use of spray powder)
04.09 Apply basic principles of plate preservation after presswork for long-term storage (use of gum arabic and asphaltum)
04.10 Prepare press for operation by reviewing job-ticket specifications and then selecting appropriate press and materials
04.11 Prepare press for operation based on interrelationships of lithographic process
04.12 Mix fountain solution from concentrate
04.13 Mix ink to PMS (Pantone Matching System) specifications
04.14 Introduce ink and fountain solution to press in proper sequence
04.15 Set up and adjust feeder to paper specifications (air blast, vacuum and choke)
04.16 Set up and adjust register system to single sheet or stream fed, side guide, and head register
04.17 Set up and adjust delivery (chute or chain)
04.18 Mount plate (pack if necessary) to press specifications

04.19 Mount blanket (pack if necessary) and adjust to press specifications
04.20 Set impression cylinder to paper thickness and press specifications
04.21 Set and adjust ink and water rollers pressures to press specifications
04.22 Make-ready press to assure ink and water balance for uniform coverage, volume and replenishment of ink, image position, cylinder pressure, and sheet registration
04.23 Inspect and evaluate final make-ready sheet to job-ticket specifications and obtain proof approval to run
04.24 Set spray powder
04.25 Produce required number of press sheets to job-ticket specifications
04.26 Preserve plate for long-term storage
04.27 Perform press wash-up
04.28 Perform routine press maintenance to manufacturer's specifications

05.0 DEMONSTRATE PROFICIENCY IN PERFORMING FINISHING/BINDING OPERATIONS --The student will be able to:

05.01 Identify the equipment and materials used in finishing/binding operations, their parts and functions, and the safety rules relating to their operation
05.02 Apply basic principles of finishing/binding operations pertaining to pre-press paper cutting, post press paper cutting, and post-bindery cutting (after folding, stitching, etc.)
05.03 Apply basic principles of finishing/binding operations pertaining to sheet cutting
05.04 Apply basic principles of finishing/binding operations pertaining to grain, caliper, and finish (coated or uncoated) of paper
05.05 Apply basic principles of finishing/binding operations pertaining to signature configurations
05.06 Apply basic principles of finishing/binding operations pertaining to knife and buckle folding
05.07 Apply basic principles of finishing/binding operations pertaining to scoring and perforating
05.08 Apply basic principles of finishing/binding operations pertaining to collating and gathering
05.09 Apply basic principles of finishing/binding operations pertaining to binding alternatives (saddle, side, perfect, comb, spiral, case, etc.)
05.10 Apply basic principles of finishing/binding operations pertaining to adhesive binding (padding and fan-apart)
05.11 Apply basic principles of finishing/binding operations pertaining to packaging and identification
05.12 Demonstrate methods of counting sheets (machine, measurement, weight, and rapid multiple-sheet manual counting by fives, etc.)
05.13 Hand-jog 8 1/2" x 11" sheets
05.14 Hand-jog 17" x 22" sheets--or larger sheets
05.15 Machine-jog sheets
05.16 Prepare rule-out of press sheet for finishing operations according to job-ticket specifications and approved proof
05.17 Set up and operate cutter in accordance with rule-out
05.18 Prepare folding dummy from press sheet in accordance with job-ticket specifications and approved proof
05.19 Set up and operate folder in accordance with job-ticket specifications and folding dummy
05.20 Make a single fold
05.21 Make a multiple parallel fold
05.22 Make a right-angle fold
05.23 Identify and define slitting, perforating, and scoring functions pertaining to folding operations
05.24 Define collating flat sheets
05.25 Define gathering of signatures
05.26 Set up and operate stitcher (side- and saddle-)
05.27 Set up and operate comb binding machine
05.28 Perform paper padding functions
05.29 Define perfect, spiral, and case binding
05.30 Set up and operate a paper drill for a standard loose-leaf binder
05.31 Define die-cutting, embossing, foil-stamping, and numbering

05.32 Package and identify completed job according to job-ticket specifications including description and/or sample, quantity per package and number of packages, customer purchase order number, and job number

06.0 DEMONSTRATE THE ABILITY TO PERFORM LABORATORY PROJECTS TO INDUSTRY STANDARDS --The student will be able to:

06.01 **Clerical Administrative Support Operations**
06.02 Plan a production schedule for projects and estimate time for completion
06.03 Schedule department functions according to production schedule
06.04 Prepare a job cost estimate for each project based on established machine-hourly rate
06.05 Perform supervisory functions
06.06 **Mechanical/Creative Support Operations**
06.07 Apply basic principles of hyphenation and justification to typesetting
06.08 Prepare and produce columnar typeset copy on typesetter in manual mode, making line-ending decisions and comparing with typeset copy set in the automatic mode
06.09 Explain reasons for making line-ending decisions when preparing and producing columnar typeset copy on typesetter in manual mode
06.10 Set ruled form with headings
06.11 Set a one-column run-a-round right
06.12 Set a one-column run-a-round left
06.13 Set kerned headlines
06.14 Set letterspaced headlines
06.15 Set a series of (existing student formatted) projects that output as camera-ready art
06.16 Proofread all typeset output projects and mark corrections with proofreaders' marks
06.17 Paste up a complete mechanical following a folded, not-bound imposition allowing for bleeds and trims; i.e. brochure or four-page layout
06.18 Apply basic principles of paste-up following folded bound signature imposition allowing for lips, trims, and bleeds according to saddle-and side-stitch binding method
06.19 Apply basic principles of paste-up following folded bound signature imposition allowing for lips, trims, and bleeds according to perfect binding method
06.20 Apply basic principles of paste-up following folded bound signature imposition allowing for lips, trims, and bleeds according to spiral binding method
06.21 Apply basic principles of paste-up following folded bound signature imposition allowing for lips, trims, and bleeds according to comb binding method
06.22 Apply basic principles of paste-up following folded bound signature imposition allowing for lips, trims, and bleeds according to case binding method
06.23 Explain differences in complexities of multiple signature impositions dependent on binding method used
06.24 Proofread and mark up mechanical using proofreaders' marks on tissue overlay
06.25 Perform supervisory functions
06.26 **Perform Pre-Press Operations**
06.27 Produce line negatives from substandard weak-density copy using such alternatives as time and temperature variations, filters, filter variations, and film reversal methods
06.28 Produce line negatives from substandard colored copy using such alernatives as time and temperature variations, filters, filter variations, and film reversal methods
06.29 Produce line negatives from substandard reverse copy using such alternatives as time and temperature variations, filters, filter variations, and film reversal methods
06.30 Produce line negatives from substandard incorrectly-prepared mechanicals using such alternatives as time and temperature variations, filters, filter variations, and film reversal methods
06.31 Produce halftone negatives using black and white photos with density ranges less than, equal to, and much greater than the density range of the screen
06.32 Predetermine results of producing halftone negatives from substandard copy by using the Kodak Graphic Arts Computer

06.33 Predetermine tone-value shifts needed to reproduce more lifelike results from substandard copy
06.34 Apply basic principles of shooting flourescent copy in line and halftone negatives
06.35 Use visual inspection method of development to establish basic halftone exposure from a color photograph to establish highlight area
06.36 Apply basic principles to obtain necessary tonal shifts based on evaluation of correct highlight halftone
06.37 Produce spreads using contacting methods
06.38 Produce chokes using contacting methods
06.39 Produce screen tints using contacting methods
06.40 Produce reverses using contacting methods
06.41 Apply basic principles of stripping following folded bound signature imposition allowing for lips, trims, and bleeds according to saddle-and side-stitch binding method
06.42 Apply basic principles of stripping following folded bound signature imposition allowing for lips, trims, and bleeds according to perfect binding method
06.43 Apply basic principles of stripping following folded bound signature imposition allowing for lips, trims, and bleeds according to spiral binding method
06.44 Apply basic principles of stripping following folded bound signature imposition allowing for lips, trims, and bleeds according to comb binding method
06.45 Apply basic principles of stripping following folded bound signature imposition allowing for lips, trims, and bleeds according to case binding method
06.46 Explain the difference in complexities of multiple signature impositions dependent on the binding method
06.47 Produce tint blocks using rubylith
06.48 Produce silhouettes using rubylith
06.49 Produce reverses using rubylith
06.50 Produce halftone windows using rubylith
06.51 Predetermine screen values and standard screen angles from color wheel or Graphic Arts Technical Foundation (GATF) color communicator
06.52 Produce multicolor flats that will reproduce various colors by use of overprinting screen tints utilizing a pin register system
06.53 Perform supervisory functions
06.54 **Perform Offset Press Operations**
06.55 Apply basic principles of offset press operations with regards to work and turn, work and tumble, and sheetwise printed products
06.56 Produce a tight register one-color project
06.57 Product a tight register one- or two-color, pre-collated carbonless project
06.58 Produce a two-color tight register project
06.59 Produce a one- or two-color tight register envelope project
06.60 Produce a tight register one-color metallic ink project
06.61 Produce a tight register one- or two-color folding two-sided project
06.62 Produce a multicolor tight register project
06.63 Perform supervisory functions
06.64 **Perform Finishing/Binding Operations**
06.65 Apply basic principles of finishing and binding following folded bound signature impositions allowing for lips, trims, and bleeds according to saddle- and side-stitch binding method
06.66 Apply basic principles of finishing and binding following folded bound signature impositions allowing for lips, trims, and bleeds according to perfect binding method
06.67 Apply basic principles of finishing and binding following folded bound signature impositions allowing for lips, trims, and bleeds according to spiral binding method
06.68 Apply basic principles of finishing and binding following folded bound signature impositions allowing for lips, trims, and bleeds according to comb binding method
06.69 Apply basic principles of finishing and binding following folded bound signature impositions allowing for lips, trims, and bleeds according to case binding method
06.70 Explain the difference in complexities of multiple signature impositions dependent on binding method
06.71 Perform supervisory functions

07.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

07.01 Conduct a job search
07.02 Secure information about a job
07.03 Identify documents that may be required when applying for a job
07.04 Complete a job application form correctly
07.05 Demonstrate competence in job interview techniques
07.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
07.07 Identify acceptable work habits
07.08 Demonstrate knowledge of how to make job changes appropriately
07.09 Demonstrate acceptable employee health habits

08.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

08.01 Define entrepreneurship
08.02 Describe the importance of entrepreneurship to the American economy
08.03 List the advantages and disadvantages of business ownership
08.04 Identify the risks involved in ownership of a business
08.05 Identify the necessary personal characteristics of a successful entrepreneur
08.06 Identify the business skills needed to operate a small business efficiently and effectively

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Quality Control and Reliability Technology

CODE NUMBER: Secondary ______ Postsecondary ETI0130

Florida CIP IN15.070200

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-15

CERTIFICATION COVERAGE: IND ENGR 7

I. **MAJOR CONCEPTS/CONTENT:** The purpose of this program is to prepare students for employment as all other engineering technicians (10081898), quality control technicians (012.261-014), test technicians (019.161-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, use of equipment and tools, mathematics, work planning and layout, manufacturing processes, welding, machining and metal fabrication and methods of evaluating manufactured products.

II. **LABORATORY ACTIVITIES:** Shop or laboratory activities are an integral part of this program and provide instruction in the use of inspection tools, sketching, manufacturing control processes, layout and sampling, and testing processes.

III. **SPECIAL NOTE:** The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1350 hours.

IV. **INTENDED OUTCOMES:** After successfully completing this program, the student will be able to:

01. Demonstrate appropriate shop safety.
02. Explain quality control concepts.
03. Use and maintain tools and equipment.
04. Perform mathematical calculations.
05. Read and interpret blueprints.
06. Lay out work.
07. Explain basic machining terms and operations.
08. Develop sketches from oral descriptions and/or written information.
09. Define or explain basic welding terms and concepts.
10. Evaluate welds and identify metals.
11. Identify and describe welding processes.

Quality Control and Reliability Technology - Continued

12. Explain metal fabrication processes.
13. Explain machining fabrication processes.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
SECONDARY NUMBER: ________

PROGRAM TITLE: Quality Control and Reliability Technology
POSTSECONDARY NUMBER: ETI0130

01.0 DEMONSTRATE APPROPRIATE SHOP SAFETY--The student will be able to:

01.01 Demonstrate an awareness and understanding of health and safety hazards, prevention, correction and ecological problems and solution unique to quality control and reliability processes and systems.
01.02 Demonstrate an understanding of physical hazards.
01.03 Demonstrate an understanding of chemical hazards.
01.04 Demonstrate an understanding of biological and biomechanical hazards.
01.05 Demonstrate an awareness and understanding of fire hazards in manufacture, processing, and fabrication.
01.06 Demonstrate an understanding and procedures to control and extinguish NFPA classes of fire.
01.07 Demonstrate an awareness and understanding for the need and use of safety devices, controls, guards and equipment.
01.08 Demonstrate awareness, understanding and use of personal safety protection and devices including but not limited to goggles, safety glasses, masks, helmets, hearing protectors, air respirators, protective clothing, safety shoes and mesh gloves.
01.09 Demonstrate administration of first air procedures and accident procedures.
01.10 Demonstrate an understanding of the laws and agencies which regulate and establish safety standards including: National Safety Council (NSC), Occupational Safety and Health Administration (OSHA), National Institute of Occupational Safety and Health (NIOSH), American National Standards Institute (ANSI), National Fire Protection Association (NFPA), Underwriters Laboratories (UL), Mining Enforcement and Safety Administration (MESA), Power Tool Institute (PI), Hand Tool Institute (HTI), U. S. Consumer Products Safety Commission (CPSC), American Society of Mechanical Engineers (ASME), American Society of Agricultural Engineers (ASAF), American Society for Testing and Materials (ASTM).
01.11 Demonstrate safe use of chemicals and solvents.
01.12 Demonstrate safe use of measuring tools and hand tools.
01.13 Demonstrate safe use of portable power tools.
01.14 Demonstrate safe use of powered equipment.
01.15 Demonstrate safe storage of materials, tools, equipment and personal safety equipment.
01.16 Demonstrate disposing of waste materials.
01.17 Demonstrate safe housekeeping practices at work stations.
01.18 Demonstrate safe practices for lifting, moving and handling materials and equipment.
01.19 Demonstrate an understanding of Workers Compensation Law, workers liability and responsibilities at a work site.

02.0 EXPLAIN QUALITY CONTROL CONCEPTS--The student will be able to:

02.01 Demonstrate an understanding of the relationships between human motivation, product production, product quality, product production costs, moral and plan efficiency.
02.02 Demonstrate an understanding of the inspection processes, requirements and systems.
02.03 Demonstrate an understanding of the purposes of quality control.
02.04 Demonstrate an understanding of in-process inspection and methods to perform in-process inspections.
02.05 Demonstrate an understanding of workers' and inspectors' roles and responsibilities to ensure quality.
02.06 Demonstrate an understanding of trial run and production run.
02.07 Demonstrate an understanding of processes and techniques to ensure reliability of products.

03.0 USE AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

03.01 Identify safe and unsafe hand tools.
03.02 Demonstrate ability to maintain safe tools.
03.03 Demonstrate ability to use hand tools safely.
03.04 Identify safe and unsafe testing equipment.
03.05 Demonstrate procedures to follow when unsafe testing equipment is to be used on-line.

03.06 Demonstrate safe use of testing equipment used for tensile-compression testing, bending testing, impact testing, fatigue testing, shear testing, hardness testing, liquid-penetrant testing, radiographic testing, ultrasonic testing, magnetic-analysis testing, electrical-analysis testing, X-ray and Gamma ray testing.
03.07 Demonstrate an understanding of safety considerations workers must apply when using tools and equipment.
03.08 Demonstrate proper use of safety equipment and personal safety devices relative to the tools and equipment to be used.
03.09 Demonstrate ability to clean, adjust, calibrate and set up testing equipment for safe use.
03.10 Demonstrate ability to select proper tools and equipment for materials and products to be tested or inspected.

04.0 PERFORM MATHEMATICAL CALCULATIONS--The student will be able to:

04.01 Demonstrate the ability to apply arithmetic.
04.02 Demonstrate the ability to apply basic algebra and applied algebra, including foundations of geometry.
04.03 Demonstrate the ability to apply trigonometry.
04.04 Demonstrate the ability to use standard and metric measurements and notes.
04.05 Demonstrate practical applications of mathematics.

05.0 READ AND INTERPRET BLUEPRINTS--The student will be able to:

05.01 Use working drawings which include detail and assembly drawings.
05.02 Use and interpret information on exterior view, sectional view, auxiliary views, balloon drawings, exploded views, perspective drawings, line diagrams, charts, graphs, pert charts, CAD/CAM and CAMM programs.
05.03 Describe, identify and use symbols and abbreviations.
05.04 Use and interpret field notes, technical manual information, bulletins and specifications.
05.05 Modify and perform field changes to original information from written or verbal instructions.
05.06 Read/convert and use English and metric measurements.
05.07 Use English and metric measuring tools, scales and instruments.
05.08 Use English and metric conversion and reference charts, tables and graphs.

06.0 LAY OUT WORK--The student will be able to:

06.01 Use drawings, blueprints, specifications and other required information to plan a proper sequence to determine the quality of a product and test its reliability.
06.02 Select appropriate methods, tools and equipment to perform quality and reliability tests.
06.03 Prepare a written procedure for a particular product quality and reliability tests.
06.04 Prepare a written inspection procedure for production lines.
06.05 Prepare a product evaluation procedure incorporating quality and reliability testing, production line trial run information and prototype expectations.
06.06 Prepare final documentation for approval and acceptance for product production runs.

07.0 EXPLAIN BASIC MACHINING TERMS AND OPERATIONS--The student will be able to:

07.01 Identify the parts of and explain the differences between: engine lathe, speed lathe, toolroom lathe, tracer lathes, turret lathe, automatic chucking lathe and automatic screw machine.
07.02 Identify the parts of and explain the differences between milling machines, including: column-knee, fixed bed, planer type, duplicating mills, hobbing machine.
07.03 Identify the parts of and explain the differences between drilling machines, including: upright drilling machines, radial drilling machines, multiple-spindle drilling machines, gang drilling machines, two-way horizontal multiple-spindle drilling machines, deep-hole drilling machine, jig boring machine.
07.04 Identify the parts of and explain the differences between saws, including: reciprocating saws, band saws and circular saws.
07.05 Identify the parts of and explain the differences between grinding machines, including: surface grinders, cylindrical grinders and special grinding machines.

07.06 Identify the parts of and explain the differences between grinders, including: lapping, honing, drum and blasting.
07.07 List and define operations which machines in the following categories can perform: lathes, shapers, planers, broaches, mills, drills, saws and grinders.

08.0 DEVELOP SKETCHES FROM ORAL DESCRIPTIONS AND/OR WRITTEN INFORMATION--The student will be able to:

08.01 Translate verbal instruction into working notes.
08.02 Translate working notes into legible sketches.
08.03 Demonstrate use of appropriate symbols and abbreviations.
08.04 Demonstrate proper use of scales, triangles and graph papers.
08.05 Demonstrate use of symbols templates.
08.06 Demonstrate proper placement of appropriate production or change notations on sketches.

09.0 DEFINE OR EXPLAIN BASIC WELDING TERMS AND CONCEPTS--The student will be able to:

09.01 List welding terms and trade technology associated with the five major categories of welding which are: solid state, brazing, gas welding, resistance welding, arc welding and other processes.
09.02 Define trade terms and abbreviations commonly found in welding manual glossary.
09.03 List and define comparative difference between the five major welding methods.

10.0 EVALUATE WELDS AND IDENTIFY METALS--The student will be able to:

10.01 Evaluate the quality of welds by utilizing the following methods of testing welds: fracture test, tensile test, bend test, metallographic test, visual inspection, magnetic particle inspection, liquid penetrant tests, ultrasonic tests, radiographic test.
10.02 Identify the following types of weld defects: cracks, porosity, cold shut, inclusions, lack of fusion, and undercut.
10.03 Identify common metals visual test (form, weight, color, shape).
10.04 Identify metals using the following processes: spark test, chip test, melting temperature, magnet test and weight test.

11.0 IDENTIFY AND DESCRIBE WELDING PROCESSES--The student will be able to:

11.01 Identify, list and describe the following welding processes: carbon arc welding, shielded metal arc welding, flux cored arc welding, gas metal arc welding, gas tungsten arc welding, submerged arc welding, plasma arc welding, stud welding, percussion welding, upset welding, flash welding, projection welding, resistance seam welding, resistance spot welding, pressure gas welding, oxy-hydrogen welding, oxy-acetylene welding, dip brazing, resistance brazing, induction brazing, furnace brazing, torch brazing, infra-red brazing, cold welding, diffusion welding, explosion welding, forge welding, friction welding, ultrasonic welding, electron beam welding, electro-slag welding, induction welding, laser beam welding and thermit welding.
11.02 List and describe equipment, supplies and tools necessary to perform the processes listed above.

12.0 EXPLAIN METAL FABRICATION PROCESSES--The student will be able to:

12.01 List and describe procedures for preparing metal for fabrication.
12.02 List and describe processes for mechanically attaching metal together (light gauge and heavy gauge).
12.03 List and describe processes for physically bonding metal together.

13.0 EXPLAIN MACHINING FABRICATION PROCESSES--The student will be able to:

13.01 List and explain the processes and machines necessary to accomplish the following fabrication requirements: cutting, shaping, forming, turning, drilling, finishing, pressing, drawing, bending, shearing, slitting, rolling, forging, swaging, hobbing, coining, surfacing, extruding, braking, notching, nibbling, piercing, blanking, trimming, perforating, truing, shaving.
13.02 List and explain the measuring tools, hand tools, machines and materials necessary to perform each of the fabrication processes listed above.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK

FLORIDA DEPARTMENT OF EDUCATION

PROGRAM AREA: Industrial

EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Related Trade and Industrial Technology

CODE NUMBER: Secondary ________ Postsecondary ETI0680

Florida CIP IN46.999902

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVELS(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 13-15

CERTIFICATION COVERAGE: ANY IND EDUCATION LEVEL 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare individuals for trade or industry-specific education. It is intended to provide the basic and supportive skills required for successful entry and completion of programs offering more trade or industry-specific training or to provide supplemental training for persons previously or currently employed in the various trade and industrial occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, trade or industry related general education skills (English, mathematics, physics); familiarity with tools, machinery and equipment appropriate to various trade and industrial occupations; familiarity with working drawings and blueprints appropriate to various trade and industrial occupations; technical recording and reporting; and a variety of miscellaneous skills to provide a broad base of knowledge to support trade or industry-specific education and training in specialty areas.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction and experience in the recording and reporting of data, the application of problem-solving techniques, interpretation of shop and working drawings, appropriate basic trade and industrial English and mathematics skills, the application of appropriate specifications, the preparation of data or laboratory logbooks, the application of principles of physics, and practical experience in the application of safety principles and procedures.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing communicatons, leadership, human relations, and employability training experiences and for reinforcing specific vocational skills. When provided, these activities are considered an integral part of this program.

In accordance with Section 233.0695 F.S., the minimum basic mathematics and English skills grade level required for this postsecondary adult vocational program is the same as the level required for the trade or industry-specific program the student intends to enter. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 450 hours.

IV. INTENDED OUTCOMES: After sucessfully completing this program, the individual will be able to:

01. Demonstrate appropriate trade or industry related language skills.
02. Apply trade or industry related mathematical concepts and perform trade or industry related calculations.

Related Trade and Industrial Technology - Continued

03. Demonstrate trade or industry related applied physics skills.
04. Apply and use safety rules and standards.
05. Apply trade or industry related shop or laboratory skills.
06. Demonstrate knowledge and use of trade or industry related tools, machinery, and equipment.
07. Demonstrate a basic knowledge of trade or industry related shop or working drawings.
08. Demonstrate the ability to operate and use appropriate trade and industry computer hardware and software.
09. Demonstrate proficiency in technical recording and reporting.
10. Demonstrate and apply knowledge of miscellaneous trade and industry related skills.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education

SECONDARY NUMBER: ____________

PROGRAM TITLE: Related Trade and Industrial Technology

POSTSECONDARY NUMBER: ETI0680

01.0 DEMONSTRATE APPROPRIATE TRADE OR INDUSTRY RELATED LANGUAGE SKILLS --The student will be able to:

- 01.01 Identify and define frequently used trade or industry related terms by sight
- 01.02 Determine the main idea of trade or industry related memos and instructions
- 01.03 Identify and list the order of events in a set of trade or industrial specifications/instructions
- 01.04 Write a statement of how to follow a given set of written trade or industrial instructions
- 01.05 Obtain appropriate trade or industry related information from pictures, maps, or signs
- 01.06 Identify the sources from which to obtain trade or industry related information
- 01.07 Demonstrate basic trade or industry related language writing skills
- 01.08 Write a paragraph presenting trade or industry related information in chronological order
- 01.09 Write a trade or industry related request for personnel, request for materials or supplies, request for information, notation of assignment, and change order that includes the necessary information for each
- 01.10 Write a clear, concise, and sequenced series of brief statements describing the steps of a trade or industry related process or event
- 01.11 Use a proper form when writing a simple trade or industry related business letter and addressing an envelope for it
- 01.12 Write a trade or industry related letter of request, adjustment, complaint, application, or opinion which contains necessary and accurate information
- 01.13 Proofread trade or industry related reports for spelling
- 01.14 Write a trade or industry related memorandum using a proper format

02.0 APPLY TRADE OR INDUSTRY RELATED MATHEMATICAL CONCEPTS AND PERFORM APPROPRIATE TRADE OR INDUSTRY RELATED CALCULATIONS--The student will be able to:

- 02.01 Read and interpret measuring devices
- 02.02 Add 100 addition combinations
- 02.03 Add two-digit numbers
- 02.04 Add three-digit numbers
- 02.05 Subtract 100 subtraction combinations
- 02.06 Subtract two, three, and four-digit numbers
- 02.07 Solve one-digit divisor problems
- 02.08 Solve two-digit divisor problems
- 02.09 Solve three-digit divisor problems
- 02.10 Solve multiplication facts
- 02.11 Multiply by a one-digit factor
- 02.12 Multiply by a two-digit factor
- 02.13 Identify parts of a fraction
- 02.14 Solve fractional word problems
- 02.15 Convert fractions
- 02.16 Solve decimal notations
- 02.17 Solve number word problems
- 02.18 Round to nearest whole number
- 02.19 Add decimals
- 02.20 Divide a decimal by a decimal
- 02.21 Divide a whole number by a decimal
- 02.22 Write fractions as decimals and percents
- 02.23 Write percents as fractions and decimals
- 02.24 Solve percent problems
- 02.25 Compute board feet
- 02.26 Compute cost of materials
- 02.27 Solve basic ratio and proportion problems
- 02.28 Operate simple hand-held calculators

02.29 Convert board feet to linear feet and vice versa
02.30 Read, interpret, and apply metric conversion tables
02.31 Solve basic algebraic problems
02.32 Solve basic geometric problems
02.33 Solve basic trigonometric problems
02.34 Name the seven basic units in the International System of Units (SI) and give the symbol and quantity measured for each
02.35 State the name prefix symbol for the multiple 10(-18)
02.36 Calculate a weight in pounds, given a mass in kilograms
02.37 Identify the term Angle
02.38 Measure an angle, given a protractor
02.39 Define the term Degree
02.40 Define the term Radian
02.41 Define the term Sine of an Angle
02.42 Define the term Cosine of an Angle
02.43 Define the term Tangent of an Angle
02.44 Apply the Pythagorean theorm to determine the third side of a triangle when given a right triangle with two known sides
02.45 List at least four common examples of scalar quantities
02.46 List at least four common examples of vector quantities
02.47 Draw a technically-acceptable graph from a table of experimental data suitable for plotting on rectangular-coordinate graph paper; the resulting graph may be linear or nonlinear
02.48 Write a given decimal number in scientific notation
02.49 Write a number given in scientific notation in decimal form
02.50 Add, subtract, multiply, or divide using power-of-ten numbers
02.51 Find logarithms and antilogarithms of given numbers.
02.52 Multiply and divide numbers and solve equations using the three theorems of logarithms for products and quotients
02.53 Measure linear dimensions with a vernier caliper.

03.0 DEMONSTRATE TRADE- OR INDUSTRY-RELATED APPLIED PHYSICS SKILLS

--The student will be able to:

03.01 Demonstrate applied skills in mechanics
03.02 Apply and solve vectors
03.03 Solve force and motion problems
03.04 Solve work, energy, and power problems
03.05 Solve friction problems
03.06 Solve circular motion problems
03.07 Solve rotational motion problems
03.08 Solve problems involving the properties of solids
03.09 Solve problems involving the properties of liquids
03.10 Solve problems involving the properties of gases
03.11 Demonstrate applied skills in heat, light, and sound
03.12 Solve temperature and heat problems
03.13 Solve change-of-state problems
03.14 Solve heat transfer problems
03.15 Solve thermodynamic problems
03.16 Solve refrigeration and air conditioning problems
03.17 Solve harmonic motion problems
03.18 Solve sound wave problems
03.19 Solve light problems
03.20 Solve optical problems
03.21 Demonstrate applied skills in electricity and magnetism
03.22 Solve electric circuit problems
03.23 Solve electro-magnetic problems
03.24 Solve alternating current problems
03.25 Solve generator and motor problems
03.26 Solve electrostatic problems
03.27 Solve magnetism problems
03.28 Apply knowledge of strengths of materials
03.29 Solve equilibrium problems
03.30 Solve stress and strain problems
03.31 Solve centroid and inertia problems
03.32 Solve connection/joint problems
03.33 Solve problems with beam stresses
03.34 Solve torsion problems
03.35 Solve compression problems
03.36 Solve tension problems
03.37 Solve force combination problems

04.0 APPLY AND USE SAFETY RULES AND STANDARDS--The student will be able to:

04.01 Demonstrate knowledge and use of general safety rules
04.02 Apply general shop or laboratory safety rules and procedures
04.03 Demonstrate the operation of shop safety devices
04.04 Apply fire safety rules and procedures
04.05 Apply rules and procedures for electrical safety
04.06 Apply safety rules and procedures applicable to stationary or moving machinery and the use and maintenance of machine safety guards
04.07 Apply safety rules and procedures applicable to the use of moving transports (forklifts, conveyors, small electric trucks and flatbeds, etc.) and those to be followed where such transports are being operated
04.08 Apply safety rules and procedures to be followed when operating or using hoists, cranes, elevators, and other lifting equipment
04.09 Apply safety rules and procedures to be followed when constructing or using scaffolding
04.10 Demonstrate safety procedures to be followed in areas where heavy equipment (earth haulers, dump trucks, cranes, scrapers, bulldozers, various heavy trucks, etc.) is being operated
04.11 Demonstrate minimal first-aid skills
04.12 Identify safety headgear and where, how, and why it is to be used
04.13 Identify safety straps and belts and where, how, and why they are to be used
04.14 Identify safety clothing (gloves, nets, aprons, goggles, soft-soled shoes or caulked boots, etc.) and where, how, and why it is to be used
04.15 Determine and demonstrate how to apply the OSHA regulations regarding manufacturing enclosures and machinery
04.16 Determine and demonstrate how to apply the OSHA regulations regarding air and noise pollution, their control, and the maximum levels allowable
04.17 Determine and demonstrate how to apply the OSHA regulations regarding safeguards required when using small hand and power tools and larger machine tools
04.18 Determine the rules applicable to the requirements for claims involving disability and unemployment insurance

05.0 APPLY TRADE- OR INDUSTRY-RELATED SHOP OR LABORATORY SKILLS--The student will be able to:

05.01 Apply appropriate reading and writing skills in the writing and preparation of shop or laboratory reports or logbooks and in the technical recording and reporting of shop or laboratory data
05.02 Apply appropriate mathematical concepts and calculations to solve given shop or laboratory projects or assignments
05.03 Apply appropriate physics concepts and calculations in the solution of given shop or laboratory projects or assignments
05.04 Apply appropriate safety rules, regulations, and procedures in a shop or laboratory setting
05.05 Demonstrate the ability to research, locate, and apply the appropriate specifications to given trade- or inductry-related projects
05.06 Apply knowledge of working drawings to produce usable shop or laboratory products for various trades or industries

06.0 DEMONSTRATE KNOWLEDGE AND USE OF TRADE- OR INDUSTRY-RELATED TOOLS, MACHINERY, AND EQUIPMENT--The student will be able to:

06.01 Identify and explain the use of the hand tools used in the construction industries (carpentry, masonry, plumbing, welding, wiring, etc.)
06.02 Demonstrate knowledge and use of the smaller power tools
06.03 Identify and explain the use of the smaller power tools used in the construction industries (carpentry, masonry, plumbing, welding, wiring, etc.)
06.04 Identify and explain the use of the larger tools and machinery used in the construction industries (carpentry, masonry, plumbing, welding, wiring, etc.)
06.05 Demonstrate knowledge and use of heavy machinery and equipment

06.06 Identify and explain the use of the heavy machinery and equipment used in the construction industries (carpentry, masonry, plumbing, welding, wiring, etc.)

07.0 DEMONSTRATE A BASIC KNOWLEDGE OF TRADE- AND INDUSTRY-RELATED WORKING DRAWINGS--The student will be able to:

07.01 Read and interpret drafting symbols
07.02 Read and apply appropriate information from simple trade and industry drawings
07.03 Locate, read, and apply trade and industry specifications

08.0 DEMONSTRATE THE ABILITY TO OPERATE AND USE APPROPRIATE TRADE AND INDUSTRY COMPUTER HARDWARE AND SOFTWARE--The student will be able to:

08.01 Operate computer equipment and peripherals
08.02 Interpret printed output
08.03 Demonstrate postprocessing file management skills
08.04 Create computer output microfiche (com) files
08.05 Create photo processing files
08.06 Create numerical control files

09.0 DEMONSTRATE PROFICIENCY IN TRADE- & INDUSTRIAL-RELATED TECHNICAL RECORDING AND REPORTING--The student will be able to:

09.01 Record data and design curves and graphs
09.02 Write reports and make oral presentations
09.03 Maintain test and trade or industry data logs
09.04 Make equipment failure reports
09.05 Specify and requisition simple parts and supplies
09.06 Compose technical letters and memoranda
09.07 Write formal reports of laboratory experiences
09.08 Draft preventive maintenance and calibration procedures

10.0 DEMONSTRATE AND APPLY KNOWLEDGE OF MISCELLANEOUS TRADE- AND INDUSTRY-RELATED SKILLS--The student will be able to:

10.01 Demonstrate knowledge and use of scheduling techniques
10.02 Create trade and industry related PERT charts to the scheduling of a simple hypothetical project
10.03 Create trade and industry related CPM charts to the scheduling of a simple hypothetical project
10.04 Create trade and industry related GANT charts or lists to the scheduling of a simple hypothetical project
10.05 Demonstrate knowledge and use of electronic calculators and other general work support tools
10.06 Demonstrate knowledge and use of trade and industry related reference materials
10.07 Demonstrate the ability to read and interpret appropriate trade and industrial blueprints
10.08 Demonstrate knowledge and ability in trade and industry related problem solving
10.09 Demonstrate knowledge and use of trade or industry terms and terminology

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search
11.02 Secure information about a job
11.03 Identify documents that may be required when applying for a job
11.04 Complete a job application form correctly
11.05 Demonstrate competence in job interview techniques
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
11.07 Identify acceptable work habits
11.08 Demonstrate knowledge of how to make job changes appropriately
11.09 Demonstrate acceptable employee health habits

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Residential and Commercial Carpentry

CODE NUMBER: Secondary _______ Postsecondary BCT0181

Florida CIP IN46.020100

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-17

CERTIFICATION COVERAGE: TEC CONSTR @ 7 CARPENTRY 7 BLDG CONSTR@ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as carpenters (50020201), construction carpenters (860.381-022), maintenance carpenters (860.281-010), rough construction carpenters (860.381-042), construction form builders (860.381-046), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills; leadership skills; human relations and employability skills; safe and efficient work practices; use and care of hand tools, power tools, equipment; selection, application and care of materials; interpretation of blueprints and specifications; laying out, fabricating, erecting, installing, and repairing residential and commercial structures and fixtures using hand and power tools.

II. LABORATORY ACTIVITIES: Carpentry shop or laboratory activities are an integral part of this program and include selection, use and care of tools and equipment; selection and use of materials; estimating and blueprint reading to construct or repair common systems of residential and commercial framing and concrete form building.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in safety and first aid practices.
02. Convey knowledge and identify values of the construction industry.
03. Demonstrate proficiency in appropriate and identified shop practices.
04. Convey knowledge of basic mathematics.
05. Demonstrate knowledge of the free enterprise system.
06. Read blueprints.
07. Set up and use the transit, level and laser.
08. Handle and store materials.

09. Use fasteners and hardware.
10. Conduct site preparation and layout.
11. Construct footing forms, wall forms, edge forms and curb forms.
12. Construct vertical piers, columns, horizontal beam forms, above grade slab forms, stair forms, and bridge deck forms.
13. Describe use of fireproof encasement forms.
14. Use tilt-up and pre-cast construction.
15. Use scaffolding.
16. Set up and operate oxyacetylene welding equipment for cutting and burning.
17. Use structural shoring.
18. Frame floors and sills.
19. Frame partitions.
20. Frame roofs.
21. Build trusses.
22. Perform light framing.
23. Install structural timbers.
24. Install decking and sheathing.
25. Install exterior wall covering and trim.
26. Apply weather stripping and caulking compounds.
27. Install doors, window frames and units.
28. Install interior dry wall materials.
29. Install cabinets, fixtures, and shelving.
30. Construct interior stairs.
31. Hang interior doors including trim and hardware.
32. Install paneling, furring, soffitt and ceilings.
33. Install insulation and sound control materials.
34. Use plastic laminates.
35. Demonstrate employability skills.
36. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education
SECONDARY NUMBER: ______
PROGRAM TITLE: Residential and Commercial Carpentry
POSTSECONDARY NUMBER: BCT0181

01.0 DEMONSTRATE PROFICIENCY IN SAFETY AND FIRST AID PRACTICES--The student will be able to:

01.01 Demonstrate the ability to work safely.
01.02 Demonstrate the ability to keep a clean, orderly and safe work area.
01.03 Operate a fire extinguisher.
01.04 Qualify in and apply basic first aid procedures.
01.05 Demonstrate safe use of hand and power tools.
01.06 Recognize and identify common safety hazards.

02.0 CONVEY KNOWLEDGE AND IDENTIFY VALUES OF THE CONSTRUCTION INDUSTRY--The student will be able to:

02.01 Interpret the importance of the construction industry to the national economy.
02.02 Identify the employment opportunity in the construction industry.

03.0 DEMONSTRATE PROFICIENCY IN APPROPRIATE AND IDENTIFIED SHOP PRACTICES--The student will be able to:

03.01 Identify hand tools.
03.02 Select correct tool according to job.
03.03 Demonstrate safe and proper use and care of hand tools.
03.04 Identify power tools.
03.05 Select the correct power tool according to the job.
03.06 Demonstrate safe and proper use and care of power tools.
03.07 Identify special tools.
03.08 Select the correct special tool according to the job.
03.09 Demonstrate safe and proper use and care of special tools.
03.10 Demonstrate safe and proper use and care of special tools requiring OSHA certification.

04.0 CONVEY KNOWLEDGE OF BASIC MATHEMATICS--The student will be able to:

04.01 Read and interpret measuring devices (rules and tapes).
04.02 Add 100 addition combinations.
04.03 Add two-digit numbers.
04.04 Add three digit numbers.
04.05 Subtract 100 subtraction combinations.
04.06 Subtract two, three and four digit numbers.
04.07 Solve one-digit divisor problems.
04.08 Solve two-digit divisor problems.
04.09 Solve two and three-digit divisor problems.
04.10 Solve multiplication facts.
04.11 Multiply by a one-digit factor.
04.12 Multiply by a two-digit factor.
04.13 Identify parts of a fraction.
04.14 Identify fractional parts.
04.15 Solve fractional word problems.
04.16 Classify types of fractions.
04.17 Illustrate equivalent fractions.
04.18 Convert fractions.
04.19 Reduce fractions.
04.20 Solve decimal notations.
04.21 Solve number word problems.
04.22 Round to nearest whole number.
04.23 Add decimals.
04.24 Subtract decimals.
04.25 Multiply decimals.
04.26 Divide a decimal by a decimal.
04.27 Divide a whole number by a decimal.
04.28 Write fractions as decimals and percents.
04.29 Write percents as fractions and decimals.
04.30 Solve percent problems.
04.31 Find percent problems
04.32 Compute board feet.
04.33 Compute cost of materials.
04.34 Calculate amount of wire mesh for a job.
04.35 Solve basic ratio and proportion problems.
04.36 Operate single hand-held calculators.

04.37 Convert board feet to linear feet and vice versa.
04.38 Read, interpret, and apply metric conversion tables.

05.0 DEMONSTRATE KNOWLEDGE OF THE FREE ENTERPRISE SYSTEM--The student will be able to:

05.01 State the importance of the free enterprise system to the economy.
05.02 State the role of the construction industry within the free enterprise system.

06.0 READ BLUEPRINTS--The student will be able to:

06.01 Read architect's scale using quarter scale or ¼" = 1'.
06.02 Read architect's scale using eighth scale or 1/8" = 1'.
06.03 Read architect's scale using full scale or 12" = 1'.
06.04 Read architect's scale using half scale or 6' = 1'.
06.05 Read architect's scale using one-fourth scale or 3" = 1'.
06.06 Read architect's scale using one-eighth scale or 1-½" =1'.
06.07 Read engineer's scale using scale of 1" = 1'.
06.08 Read engineer's scale using scale of 1" = 30'.
06.09 Read engineer's scale using scale of 1" = 50'.
06.10 Identify architectural elevations.
06.11 Identify architectural schedules.
06.12 Identify lines and symbols.
06.13 Identify mechanical symbols.
06.14 Identify electrical symbols.
06.15 Identify topographic symbols.
06.16 Read and interpret blueprints and specifications.

07.0 SET UP AND USE THE TRANSIT, LEVEL AND LASER--The student will be able to:

07.01 Set up and adjust the builder's level.
07.02 Set up and adjust the over-point and establish lines with two points.
07.03 Read the self-reading rod (positive reading and direct reading).
07.04 Perform differential leveling jobs.
07.05 Use transits.
07.06 Use builder's levels.
07.07 Use lasers.

08.0 HANDLE AND STORAGE OF MATERIALS--The student will be able to:

08.01 Receive material and store properly at job site.
08.02 Identify defects and blemishes that affect durability and strength of lumber.
08.03 Strip wood, patented, and metal and fiberglass forms.
08.04 Handle material safely in order to avoid damage to yourself and material.
08.05 Attach accessories for load lifting.
08.06 Attach types of hitches for load lifting.
08.07 Tie types of knots used in rigging.

09.0 USE FASTENERS AND HARDWARE--The student will be able to:

09.01 Identify assortments of fasteners.
09.02 Identify assortments of hardware.
09.03 Install appropriate fasteners according to job.
09.04 Install appropriate hardware according to job.

10.0 CONDUCT SITE PREPARATION AND LAYOUT--The student will be able to:

10.01 Identify building layout.
10.02 Erect batter boards and locate building lines.
10.03 Locate building line points on batter boards using a transit.
10.04 Locate building lines on a plot plan from a set of datum.
10.05 Lay out a building using batter boards.
10.06 Square a building using the 3-4-5 rule.
10.07 Square a building using the diagonal method.

11.0 CONSTRUCT FOOTING FORMS, WALL FORMS, EDGE FORMS AND CURB FORMS--The student will be able to:

11.01 Identify the parts of a form.
11.02 Identify types of forms.
11.03 Install inbeds for various forms.

11.04 Identify styles of footings.
11.05 Construct and set forms for a continuous form.
11.06 Construct and set forms for a pile cap.
11.07 Construct and set a pier footing form.
11.08 Strip a pier footing form and prepare it for erection at another location.
11.09 Construct straight wall with representative patented forms.
11.10 Construct gang forms for battered wall.
11.11 Construct circular wall forms built in place.
11.12 Construct panel forms.
11.13 Construct slip forms.
11.14 Remove forms and prepare for storage.
11.15 Construct edge forms for a floor without foundation walls.
11.16 Construct edge forms for a floor with foundation walls.
11.17 Construct edge forms for a stoop.
11.18 Identify types of curbs or curbs and gutters.
11.19 Identify types of median forms.
11.20 Identify a curb and gutter form.
11.21 Construct a curb and gutter form.
11.22 Construct forms for catch basins.

12.0 CONSTRUCT VERTICAL PIERS, COLUMNS, HORIZONTAL BEAM FORMS, ABOVE GRADE SLAB FORMS, STAIR FORMS, AND BRIDGE DECK FORMS--The student will be able to:

12.01 Identify column shapes.
12.02 Identify types of column corners.
12.03 Construct form for a round, fluted column.
12.04 Construct form for a square column.
12.05 Erect patented column forms.
12.06 Identify parts of beam forms.
12.07 Construct a spandrel beam form.
12.08 Construct an interior beam form.
12.09 Construct an inverted beam form, post-tensioned.
12.10 Identify parts of a slab forming system.
12.11 Identify types of slabs.
12.12 Construct forms for a two-way joist system.
12.13 Construct forms for a one-way joist system.
12.14 Construct flying forms for a flat slab.
12.15 Strip a two-way joist form system.
12.16 Set concealed void tubes.
12.17 Identify parts of stair forms.
12.18 Construct forms for suspended stairs.
12.19 Construct forms for stairs on earth.
12.20 Construct forms for short flights of stairs.
12.21 Identify parts of bridge deck forms.
12.22 Construct forms for bridge deck.

13.0 DESCRIBE USE OF FIREPROOF ENCASEMENT FORMS--The student will be able to:

13.01 State the differences in the erection of fireproof encasement forms and structural concrete forms.
13.02 Construct fireproof encasement forms for columns and beams.

14.0 USE TILT-UP AND PRE-CAST CONSTRUCTION--The student will be able to:

14.01 Describe the bracing of tilt-up panels.
14.02 Describe the erection of tilt-up panels.
14.03 Describe how to form, erect and install pre-cast wall panels using rolling metal forms.
14.04 Describe the setting pre-cast beams.
14.05 Describe setting pre-cast slabs (i.e., single or double "T").
14.06 Describe forming of spandrel beams between columns.
14.07 Describe the forming of deck using span-all metal shoring.
14.08 Describe the installation of pre-cast parapet wall sections.

15.0 USE SCAFFORDING--The student will be able to:

15.01 Set up, tie off and inspect sections of scaffold with safety rails.
15.02 Construct double pole scaffold.

16.0 SET UP AND OPERATE OXYACETYLENE WELDING EQUIPMENT FOR CUTTING AND BURNING--The student will be able to:

16.01 Apply safety standards for cutting and burning.
16.02 Set up equipment for oxyacetylene cutting.

16.03 Turn on, light, adjust to a neutral flame, and turn off oxyacetylene cutting equipment.
16.04 Make ninety-degree cuts on mild steel and restart a cut.
16.05 Cut round stock.
16.06 Braze weld a square groove butt joint.

17.0 USE STRUCTURAL SHORING--The student will be able to:

17.01 Erect patented design shoring.
17.02 Construct, erect conventional shoring.
17.03 Erect safety shoring for excavation.

18.0 FRAME FLOORS AND SILLS--The student will be able to:

18.01 Identify framing numbers.
18.02 Build box sill and install floor joint.
18.03 Install bridging.
18.04 Lay subfloor.
18.05 Install floor joists for cantilever floor.

19.0 FRAME PARTITIONS--The student will be able to:

19.01 Identify framing members used in wall and partition construction.
19.02 Identify types of partition "T's".
19.03 Lay out wall and partition locations on floor.
19.04 Cut studs, trimmers, cripples and headers to length.
19.05 Cut fire stops.
19.06 Build "t's", corners and headers.
19.07 Lay out and assemble wall sections.
19.08 Install sheathing.
19.09 Lay out and install ceiling joists.

20.0 FRAME ROOFS--The student will be able to:

20.01 Identify roofing members.
20.02 Identify roof styles.
20.03 Identify roof framing units.
20.04 Compute length of common rafters.
20.05 Compute length of hip rafters.
20.06 Compute length of jack rafters.
20.07 Lay out rafter location on plate and ridge on two-foot centers.
20.08 Lay out, cut and erect rafters.
20.09 Apply roof sheathing.
20.10 Install asphalt-composition strip shingles.

21.0 BUILD TRUSSES--The student will be able to:

21.01 Identify main parts of truss.
21.02 Identify pieces of hardware used in truss construction.
21.03 Construct trusses.
21.04 Brace trusses.

22.0 PERFORM LIGHT FRAMING--The student will be able to:

22.01 Lay out wall lines.
22.02 Install metal door bucks.
22.03 Install steel studs.

23.0 INSTALL STRUCTURAL TIMBERS--The student will be able to:

23.01 Identify components in structural timber construction.
23.02 Identify connecting devices with structural timbers.
23.03 Identify hardware items used in structural timber construction.
23.04 Install heavy structural timber.

24.0 INSTALL DECKING AND SHEATHING--The student will be able to:

24.01 Identify types of decking or planking.
24.02 Install sheathing.
24.03 Install wood splice plate.
24.04 Install metal splice plate.
24.05 Install metal hangers.
24.06 Install metal shoe connection.
24.07 Install column cap.
24.08 Install metal strap and shear plate connection.

24.09 Install lateral ties and split rings.

25.0 INSTALL EXTERIOR WALL COVERING AND TRIM--The student will be able to:

25.01 Identify styles of cornice.
25.02 Identify types of cornice molding.
25.03 Identify styles of siding.
25.04 Build a box cornice.
25.05 Install siding and trim.

26.0 APPLY WEATHER STRIPPING AND CAULKING COMPOUNDS--The student will be able to:

26.01 Install weather stripping.
26.02 Apply caulking.

27.0 INSTALL DOORS, WINDOW FRAMES AND UNITS--The student will be able to:

27.01 Install window units.
27.02 Install exterior door frames and hang doors.
27.03 Identify parts of door frame.
27.04 Identify parts of window unit.

28.0 INSTALL INTERIOR DRY WALL MATERIALS--The student will be able to:

28.01 Install gypsum wallboard.
28.02 Apply laminated gypsum wallboard.

29.0 INSTALL CABINETS, FIXTURES, AND SHELVING--The student will be able to:

29.01 Identify parts of cabinet or fixture.
29.02 Identify types of cabinet door installations.
29.03 Identify cabinet hardware.
29.04 Install cabinet hardware.
29.05 Install custom-built cabinet.
29.06 Install fixtures.
29.07 Install shelving.

30.0 CONSTRUCT INTERIOR STAIRS--The student will be able to:

30.01 Identify parts of staircase.
30.02 Calculate the number of risers and treads for a stair.
30.03 Lay out, cut and assemble a stair (rough and finish).

31.0 HANG INTERIOR DOORS INCLUDING TRIM AND HARDWARE--The student will be able to:

31.01 Identify parts of interior door unit.
31.02 Identify parts of window installation.
31.03 Identify types of molding.
31.04 Install a door frame, hand, lock and trim.
31.05 Trim a window.
31.06 Case a door frame.
31.07 Install a pre-hung frame.

32.0 INSTALL PANELING, FURRING, SOFFITT AND CEILINGS--The student will be able to:

32.01 Install paneling.
32.02 Install ceiling materials.
32.03 Install curtain walls.

33.0 INSTALL INSULATION AND SOUND CONTROL MATERIALS--The student will be able to:

33.01 Install rigid installation material.

34.0 USE PLASTIC LAMINATES--The student will be able to:

34.01 Fit laminates to area.
34.02 Cut laminates.
34.03 Glue laminates.
34.04 Trim laminates for proper fit.

35.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

35.01 Conduct a job search.
35.02 Secure information about a job.
35.03 Identify documents which may be required when applying for a job interview.
35.04 Complete a job application form correctly.
35.05 Demonstrate competence in job interview techniques.
35.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
35.07 Identify acceptable work habits.
35.08 Demonstrate knowledge of how to make job changes appropriately.
35.09 Demonstrate acceptable employee health habits.

36.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

36.01 Define entrepreneurship.
36.02 Describe the importance of entrepreneurship to the American economy.
36.03 List the advantages and disadvantages of business ownership.
36.04 Identify the risks involved in ownership of a business.
36.05 Identify the necessary personal characteristics of a successful entrepreneur.
36.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Residential and Commercial Electric Wiring

CODE NUMBER: Secondary ____ Postsecondary BCT0600

Florida CIP IN46.030200

SECONDARY SCHOOL CREDITS ____ COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVELS(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 13-17

CERTIFICATION COVERAGE: ELECTRICAL 7 TEC CONSTR @ 7 BLDG CONST @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as residential and commercial electricians (824.261-010), residential and commercial electrician helpers (829.684-022), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the installation, operation, maintenance, and repair of residential and commercial electrical systems.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the installation, maintenance, repair, and modification of residential and commercial electrical systems and components in accordance with existing codes.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 contact hours (2160 clock hours).

IV. INTENDED OUTCOMES: After sucessfully completing this program, the student will be able to:

01. Demonstrate proficiency in basic electrical skills.
02. Demonstrate proficiency in DC circuits.
03. Demonstrate proficiency in AC circuits.
04. Demonstrate proficiency in residential wiring skills.
05. Demonstrate proficiency in commercial wiring skills.
06. Demonstrate employability skills.
07. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

SECONDARY NUMBER: ____________

PROGRAM AREA: Industrial Education

PROGRAM TITLE: Residential and Commercial Electric Wiring

POSTSECONDARY NUMBER: BCT0600

01.0 DEMONSTRATE PROFICIENCY IN BASIC ELECTRICAL SKILLS--The student will be able to:

01.01 **Demonstrate Proficiency in Laboratory Skills**
01.02 Apply laboratory policies and procedures.
01.03 Apply laboratory safety rules and procedures.
01.04 Demonstrate the operation of laboratory safety devices.
01.05 Demonstrate personal safety procedures.
01.06 Demonstrate first aid/emergency treatment procedures.
01.07 Apply fire safety rules and procedures.
01.08 Apply electrical safety rules and procedures.
01.09 Demonstrate procedures for disaster situations.
01.10 Solve problems requiring addition, subtraction, multiplication and division of whole numbers.
01.11 Solve problems requiring addition, subtraction, multiplication and division of common fractions.
01.12 Solve problems requiring addition, subtraction, multiplication and division of decimal numbers.
01.13 Convert decimals to fractions and fractions to decimals.
01.14 Convert English measure to metric measure and metric measure to English measure.
01.15 Solder and desolder components.
01.16 Drill holes in metal or plastic chassis.
01.17 Measure voltage in a simple circuit.
01.18 Measure amperage in a simple circuit.
01.19 Measure resistance in a simple circuit.
01.20 Produce a voltage by chemical means.
01.21 Produce a voltage by mechanical means.
01.22 Produce a voltage by thermal means.
01.23 Produce a voltage by photoelectric means.
01.24 Identify physical and mechanical abilities of the electrical trade.

02.0 DEMONSTRATE PROFICIENCY IN DC CIRCUITS--The student will be able to:

02.01 Solve basic algebraic problems as applicable to electricity/electronics (prerequisite to DC).
02.02 Relate electricity to nature of matter.
02.03 Identify sources of electricity.
02.04 Define voltage, current, resistance, power, and energy.
02.05 Apply and relate Ohm's Law.
02.06 Measure properties of a circuit using VOM and DVM meters.
02.07 Compute and measure conductance and resistance of conductors and insulators.
02.08 Analyze series circuits.
02.09 Construct series circuits.
02.10 Troubleshoot series circuits.
02.11 Draw a series circuit and calculate circuit values.
02.12 Analyze parallel circuits.
02.13 Construct parallel circuits.
02.14 Troubleshoot parallel circuits.
02.15 Draw a parallel circuit and calculate circuit values.
02.16 Analyze series-parallel circuits.
02.17 Construct series-parallel circuits.
02.18 Troubleshoot series-parallel circuits.
02.19 Draw a series-parallel circuit and calculate circuit values.
02.20 Define magnetic properties of circuits and devices.
02.21 Determine physical and electrical characteristics of capacitors and inductors.
02.22 Analyze and measure RL and RC time constants.
02.23 Set up and operate a VOM for DC circuits.
02.24 Set up and operate a DVM for DC circuits.
02.25 Set up and operate power supplies for DC circuits.
02.26 Set up and operate oscilloscopes for DC circuits.
02.27 Construct an electromagnet.
02.28 Construct a simple DC generator.
02.29 Construct a simple DC motor.

03.0 DEMONSTRATE PROFICIENCY IN AC CIRCUITS--The student will be able to:

03.01 Solve basic trigonometric problems as applicable to electricity/electronics (prerequisite to AC).
03.02 Identify properties of an AC signal.
03.03 Identify AC sources.
03.04 Analyze and measure AC signals using oscilloscope, frequency meters, and generators.
03.05 Analyze AC capacitive circuits.
03.06 Construct AC capacitive circuits.
03.07 Troubleshoot AC capacitive circuits.
03.08 Analyze AC inductive circuits.
03.09 Construct AC inductive circuits.
03.10 Troubleshoot AC inductive circuits.
03.11 Analyze and apply principles of transformers to AC circuits.
03.12 Analyze polyphase circuits.
03.13 Construct polyphase circuits.
03.14 Troubleshoot polyphase circuits.
03.15 Analyze basic motor theory and operation.
03.16 Analyze basic generator theory and operation.
03.17 Set up and operate a VOM for AC circuits.
03.18 Set up and operate a DVM for AC circuits.
03.19 Set up and operate power supplies for AC circuits.
03.20 Set up and operate impedance bridges for AC circuits.
03.21 Display and read waveforms.
03.22 Insert capacitors in series in an AC circuit.
03.23 Develop a time constant curve.
03.24 Insert inductors in series in an AC circuit.
03.25 Construct a series RL circuit.
03.26 Measure voltage across a resistor and an inductor at varying frequencies in a series RL circuit.
03.27 Measure voltage across a resistor and an inductor at various values of resistance in a series RL circuit.
03.28 Measure voltage across a resistor and an inductor at various values of inductance in a series RL circuit.
03.29 Construct a parallel RL circuit.
03.30 Analyze solid state control circuits (using diodes, IC's, SCR's, TRIAC's, etc.).
03.31 Construct solid state control circuits (using diodes, IC's, SCR's, TRIAC's, etc.).
03.32 Troubleshoot solid state control circuits (using diodes, IC's, SCR's, TRIAC's, etc.).
03.33 Analyze power and control transformers.
03.34 Construct power and control transformers.
03.35 Troubleshoot power and control transformers.
03.36 Set up and use watt-hour meters.
03.37 Measure current through a resistor and an inductor at varying frequencies in a parallel RL circuit.
03.38 Measure current through a resistor and an inductor at various values of resistance in a parallel RL circuit.
03.39 Measure current through a resistor and an inductor at various values of inductance in a parallel RL circuit.
03.40 Construct a series RC circuit.
03.41 Measure voltage across a resistor and a capacitor at varying frequencies in a series RC circuit.
03.42 Measure voltage across a resistor and a capacitor at various values of resistance in a series RC circuit.
03.43 Measure voltage across a resistor and a capacitor at various values of capacitance in a series RC circuit.
03.44 Construct a parallel RC circuit.
03.45 Measure current through a resistor and a capacitor at varying frequencies in a parallel RC circuit.
03.46 Measure current through a resistor and a capacitor at various values of resistance in a parallel RC circuit.
03.47 Measure current through a resistor and a capacitor at various values of capacitance in a parallel RC circuit.
03.48 Construct a series RLC circuit.
03.49 Measure voltage across a resistor, a capacitor, and an inductor at varying frequencies in a series RLC circuit.
03.50 Measure voltage across a resistor, a capacitor, and an inductor at various values of resistance in a series RLC circuit.
03.51 Measure voltage across a resistor, a capacitor, and an inductor at various values of capacitance in a series RLC circuit.

03.52 Measure voltage across a resistor, a capacitor, and an inductor at various values of inductance in a series RLC circuit.
03.53 Construct a parallel RLC circuit.
03.54 Measure current through a resistor, a capacitor, and an inductor at varying frequencies in a parallel RLC circuit.
03.55 Measure current through a resistor, a capacitor, and an inductor at various values of resistance in a parallel RLC circuit.
03.56 Measure current through a resistor, a capacitor, and an inductor at various values of capacitance in a parallel RLC circuit.
03.57 Measure current through a resistor, a capacitor, and an inductor at various values of inductance in a parallel RLC circuit.
03.58 Measure current and voltages in solid state control circuits.
03.59 Measure current and voltages in circuits employing transformers.

04.0 DEMONSTRATE PROFICIENCY IN RESIDENTIAL WIRING SKILLS--The student will be able to:

04.01 Obtain electrical wiring installation information from a residential floor plan.
04.02 Obtain electrical wiring installation specifications.
04.03 Draw a residential electrical floor plan.
04.04 Install and wire a single-pole switched lighting circuit.
04.05 Install and wire a three-way switched lighting circuit.
04.06 Install and wire a combination three-way and four-way switched lighting circuit.
04.07 Connect a recessed lighting circuit.
04.08 Connect a fluorescent lighting circuit.
04.09 Install and wire a duplex receptacle outlet circuit.
04.10 Install and wire a split-circuit duplex receptacle outlet circuit.
04.11 Install and wire a special-purpose receptacle outlet circuit.
04.12 Wire a space-heating circuit.
04.13 Construct a wiring diagram for a heat-pump circuit.
04.14 Construct a wiring diagram for a forced-air heating circuit.
04.15 Install a service entrance main panel.
04.16 Install a service entrance meter base.
04.17 Install a low-voltage signal system.
04.18 Install a low-voltage remote-control lighting circuit.
04.19 Install an emergency alarm system.
04.20 Calculate total job installation requirements.
04.21 Install an electrical system for a residential swimming pool.
04.22 Construct control circuits from schematics associated with drawings.
04.23 Install conduit systems for service entrances using G.R.C., I.M.C., E.M.T., and P.V.C. (above- and underground).
04.24 Determine installation requirements for mobile home parks.
04.25 Comply with N.E.C. requirements for residential wiring.

05.0 DEMONSTRATE PROFICIENCY IN COMMERCIAL WIRING SKILLS--The student will be able to:

05.01 Obtain electrical wiring installation information from a commercial floor plan.
05.02 Obtain electrical wiring installation specifications.
05.03 Draw a commercial electrical floor plan.
05.04 Install and secure flexible conduit.
05.05 Install and secure thin-wall (EMT) conduit.
05.06 Install and secure rigid conduit.
05.07 Install and secure plastic (PVC) conduit.
05.08 Install and secure wire mold.
05.09 Install and secure a duct system.
05.10 Install conductors in a conduit.
05.11 Install a commercial lighting circuit.
05.12 Install a commercial single-phase receptacle circuit.
05.13 Install an electrical system for a commercial swimming pool.
05.14 Construct control circuits from schematics associated with drawings.
05.15 Observe high voltage wiring requirements (over 600V).
05.16 Size, connect, and install power transformers to the limitations at the job site.
05.17 Comply with safety precautions when wiring in hazardous areas.
05.18 Install and service overhead lighting in parking lots, sports fields, etc..
05.19 Comply with N.E.C. requirements for commercial wiring.

05.20 Comply with local inspection authority regulations regarding the design, bidding, or construction of electrical systems.
05.21 Install a commercial three-phase receptacle circuit.
05.22 Install a commercial low-voltage signal communication circuit.
05.23 Install a commercial standby-emergency lighting circuit.
05.24 Install a commercial emergency-alarm circuit.
05.25 Calculate commercial service-entrance requirements.
05.26 Install a commercial service entrance.
05.27 Calculate total commercial-job installation costs.
05.28 Determine installation requirements for a mobile home park service.
05.29 Determine installation requirements for an elevator service.

06.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

06.01 Conduct a job search.
06.02 Secure information about a job.
06.03 Identify documents that may be required when applying for a job.
06.04 Complete a job application form correctly.
06.05 Demonstrate competence in job interview techniques.
06.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
06.07 Identify acceptable work habits.
06.08 Demonstrate knowledge of how to make job changes appropriately.
06.09 Demonstrate acceptable employee health habits.

07.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

07.01 Define entrepreneurship.
07.02 Describe the importance of entrepreneurship to the American economy.
07.03 List the advantages and disadvantages of business ownership.
07.04 Identify the risks involved in ownership of a business.
07.05 Identify the necessary personal characteristics of a successful entrepreneur.
07.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK

PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION

EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Residential and Commercial Plumbing

CODE NUMBER: Secondary ____________ Postsecondary BCT0580

Florida CIP IN46.050300

SECONDARY SCHOOL CREDITS _____ COLLEGE CREDITS _____ POSTSECONDARY ADULT VOCATIONAL CREDITS _______

APPLICABLE LEVELS(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 13-17

CERTIFICATION COVERAGE: TEC CONSTR @ 7 BLDG CONST @ 7 PLUMBIN 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as plumbers (862.381-030), pipe fitters (862.261-010), construction laborers (862.684-014), pipe fitter helpers (862.684-2), plumbing assembler-installers (862.684-026), and lawn-sprinkler installers (869.684-030), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the assembly, installation, and repair of pipes, fittings, and fixtures for heating, water, and drainage systems according to specifications and plumbing codes.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the use of plumbing tools to lay out, build, test, and maintain plumbing systems in both residential and commercial applications.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 contact hours (2160 clock hours).

IV. INTENDED OUTCOMES: After sucessfully completing this program, the individual will be able to:

01. Demonstrate proficiency in performing basic plumbing skills.
02. Demonstrate proficiency in joining pipe.
03. Demonstrate proficiency in reading and interpreting blueprints and specifications.

04. Demonstrate proficiency in laying out a job.
05. Demonstrate proficiency in installing first rough (underground).
06. Demonstrate proficiency in installing second rough (first floor and above).
07. Demonstrate proficiency in trimming out plumbing.
08. Demonstrate proficiency in repairing, servicing, and maintaining plumbing systems.
09. Demonstrate knowledge of plumbing codes.
10. Demonstrate proficiency in installing domestic hot water heating and circulating systems.
11. Demonstrate proficiency in installing hot water/steam heating systems.
12. Demonstrate proficiency in selecting and installing insulation.
13. Demonstrate proficiency in locating and laying out utilities installations (water mains, sanitary sewers, storm sewers, gas mains).
14. Demonstrate proficiency in laying out septic tank systems.
15. Demonstrate proficiency in installing interceptors and separators.
16. Demonstrate proficiency in installing gas and fuel pipe.
17. Demonstrate proficiency in installing irrigation systems.
18. Demonstrate proficiency in installing roof drains and leaders.
19. Demonstrate proficiency in installing solar heating systems (optional).
20. Demonstrate employability skills.
21. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS **EFFECTIVE DATE:** July, 1987

PROGRAM AREA: Industrial Education **SECONDARY NUMBER:** ________

PROGRAM TITLE: Residential and Commercial Plumbing **POSTSECONDARY NUMBER:** BCT0580

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING BASIC PLUMBING SKILLS --The student will be able to:

01.01 Comply with shop policies and procedures
01.02 Explain the basic theory and principles of plumbing
01.03 Identify and use hand tools
01.04 Identify equipment and safety hazards
01.05 Apply safety procedures
01.06 Identify pipe fittings
01.07 Identify pipe joining methods
01.08 Identify plumbing fixtures and appliances
01.09 Read and interpret and comply with manufacturers' schematics and specifications
01.10 Find information in technical literature
01.11 Give reports orally and in writing
01.12 Listen to and comply with oral and written instructions

02.0 DEMONSTRATE PROFICIENCY IN JOINING PIPE--The student will be able to:

02.01 Wipe a clay pipe joint
02.02 Join clay pipe with a pipe coupling
02.03 Join cast-iron pipe to clay sewer pipe
02.04 Join plastic pipe using the adapter-solvent cement method
02.05 Cut concrete pipe
02.06 Bend steel pipe with a heavy-duty bending tool
02.07 Bend steel pipe with a chain vise and torch
02.08 Cut steel pipe with a one-wheel steel pipe cutter
02.09 Cut steel pipe with a four-wheel steel pipe cutter
02.10 Join plastic pipe to steel pipe
02.11 Thread steel pipe with an adjustable diestock
02.12 Thread steel pipe with a nonadjustable diestock
02.13 Thread steel pipe with a power-driven vise stand
02.14 Cut copper tubing or pipe with a hacksaw
02.15 Cut copper tubing or pipe with a tubing cutter
02.16 Bend copper tubing or pipe with a spring bender
02.17 Join copper tubing or pipe to copper tubing or pipe
02.18 Join copper tubing to brass pipe
02.19 Join copper tubing with a compressed connector
02.20 Join copper tubing to steel pipe
02.21 Join copper tubing or pipe to plastic pipe using the sweat method
02.22 Join copper tubing or pipe to plastic pipe
02.23 Join cast-iron soil pipe using lead and oakum
02.24 Cut cast-iron soil pipe with a snap-type chain cutter
02.25 Join cast-iron soil pipe with a hubless or band-clamp coupling
02.26 Join steel pipe to cast-iron pipe with a hubless coupling
02.27 Join plastic pipe to cast-iron pipe with a hubless coupling
02.28 Braze pipe with a gas torch and filler metal
02.29 Weld pipe with an oxyacetylene torch and filler metal
02.30 Join pipe with an electric arc welder and filler metal

03.0 DEMONSTRATE PROFICIENCY IN READING AND INTERPRETING BLUEPRINTS AND SPECIFICATIONS--The student will be able to:

03.01 Apply basic math skills
03.02 Read and interpret an architect's scale
03.03 Read and interpret a 6-foot rule
03.04 Recognize and identify basic plumbing symbols
03.05 Explain the basic theory and principles of isometrics
03.06 Select fixtures

04.0 DEMONSTRATE PROFICIENCY IN LAYING OUT A JOB--The student will be able to:

04.01 Determine a materials list
04.02 Select material specifications

05.0 DEMONSTRATE PROFICIENCY IN INSTALLING FIRST ROUGH (UNDERGROUND)--The student will be able to:

05.01 Lay out a job on site
05.02 Install building drain, waste, and vent systems
05.03 Install distribution systems
05.04 Install water service
05.05 Install building sewer/septic tanks and/or approved sewer systems
05.06 Test the first rough

06.0 DEMONSTRATE PROFICIENCY IN INSTALLING SECOND ROUGH (FIRST FLOOR AND ABOVE)--The student will be able to:

06.01 Lay out a job on site
06.02 Install hangers and supports
06.03 Install building drain, waste and vent systems
06.04 Install water distribution systems
06.05 Test the second rough

07.0 DEMONSTRATE PROFICIENCY IN TRIMMING OUT PLUMBING--The student will be able to:

07.01 Distribute and place fixtures and appliances
07.02 Install and trim out fixtures
07.03 Install closet flanges
07.04 Install speed stops on water pipes
07.05 Trim out a lavatory
07.06 Trim out water closets
07.07 Trim out bath tubs
07.08 Trim out showers
07.09 Trim out kitchen sinks
07.10 Trim out washing machine drains and piping
07.11 Install garbage disposals
07.12 Hook up ice makers
07.13 Install and trim out water heaters
07.14 Install and hook up dishwashers
07.15 Test and inspect the final installation
07.16 Conduct purification tests

08.0 DEMONSTRATE PROFICIENCY IN REPAIRING, SERVICING, AND MAINTAINING, PLUMBING SYSTEMS--The student will be able to:

08.01 Establish positive customer relations
08.02 Troubleshoot and diagnose systems
08.03 Isolate problems
08.04 Determine alternative solutions
08.05 Obtain decisions from customers
08.06 Repair sewer mains
08.07 Repair water mains
08.08 Repair water closet seats, ball cocks, flush valves, floats, lift rods, ball stoppers, and trip levers
08.09 Repair leaks in traps
08.10 Repair leaks in faucets
08.11 Install sink strainers
08.12 Install heater elements
08.13 Replace or repair fixture water-supply pipes
08.14 Reseal toilets to flanges
08.15 Test and inspect repaired systems
08.16 Explain the nature of the problem(s), remedial action(s) needed, and advise the customer on preventive maintenance
08.17 Prepare a job ticket
08.18 Price a job and write the invoice
08.19 Collect for services rendered

09.0 DEMONSTRATE KNOWLEDGE OF PLUMBING CODES--The student will be able to:

09.01 Describe and explain the purpose of plumbing codes
09.02 Apply basic theory and principles of plumbing in relation to the codes
09.03 Read and locate information in the Plumbing Code
09.04 Explain and define terminology used in the Code
09.05 Explain why the Code may supercede manufacturer's specifications on products

10.0 DEMONSTRATE PROFICIENCY IN INSTALLING DOMESTIC HOT WATER HEATING AND CIRCULATING SYSTEMS--The student will be able to:

10.01 Explain the basic theory of domestic hot water heating and circulating systems
10.02 Design, size, and lay out a system
10.03 Select equipment and materials in accordance with job specifications
10.04 Lay out a job on site
10.05 Install distribution systems
10.06 Apply insulation
10.07 Install hot water heaters or boilers
10.08 Install equipment controls
10.09 Install safety devices
10.10 Test, balance, and inspect the final heating installation
10.11 Balance and adjust controls

11.0 DEMONSTRATE PROFICIENCY IN INSTALLING HOT WATER/STEAM HEATING SYSTEMS --The student will be able to:

11.01 Explain the basic theory and principles of hot water and steam heating systems
11.02 Apply safety procedures
11.03 Identify special materials
11.04 Lay out a job on site
11.05 Install distribution systems
11.06 Apply insulation
11.07 Install hot water or steam generators or boilers
11.08 Install controls
11.09 Install safety devices
11.10 Install terminal devices (radiators, steam tables, etc.)
11.11 Test, balance, and inspect the final heating installation
11.12 Balance and adjust controls

12.0 DEMONSTRATE PROFICIENCY IN SELECTING AND INSTALLING INSULATION --The student will be able to:

12.01 Explain the basic theory of insulation
12.02 Select materials in accordance with job specifications
12.03 Explain the different methods of applying insulation

13.0 DEMONSTRATE PROFICIENCY IN LOCATING AND LAYING OUT UTILITIES INSTALLATIONS (WATER MAINS, SANITARY SEWERS, STORM SEWERS, GAS MAINS) --The student will be able to:

13.01 Check for conflict with other utilities
13.02 Explain the basic standards used in the installation of all utilities
13.03 Interpret and locate utilities in accordance with a site plan
13.04 Identify special materials and procedures
13.05 Explain methods of tapping and connecting to mains
13.06 Explain the application of pumping systems to mains
13.07 Explain the need for as-built drawings and records
13.08 Explain the application of OSHA and other safety regulations
13.09 Explain the importance of integrating each utility system so as to avoid crossconnecting

14.0 DEMONSTRATE PROFICIENCY IN LAYING OUT SEPTIC TANK SYSTEMS--The student will be able to:

14.01 Explain the theory and function of a septic tank system
14.02 Identify and explain the uses of various components of a septic tank system
14.03 Explain the procedures of soil percolation and the obtaining of permits and approvals

15.0 DEMONSTRATE PROFICIENCY IN INSTALLING INTERCEPTORS AND SEPARATORS --The student will be able to:

15.01 Identify the various types of interceptors and separators
15.02 Explain the theory and function of various interceptors and separators
15.03 Install and maintain lint traps
15.04 Install and maintain grease traps
15.05 Install and maintain gas and oil separators
15.06 Install and maintain sand and sediment interceptors

16.0 DEMONSTRATE PROFICIENCY IN INSTALLING GAS AND FUEL PIPE--The student will be able to:

16.01 Explain the importance of safety in the design and installation of gas systems and components (controlled by AGA)
16.02 Design, size, and lay out a system in accordance with AGA standards
16.03 Select materials in accordance with specifications
16.04 Lay out a job on site
16.05 Install distribution systems
16.06 Install equipment and controls
16.07 Install safety devices
16.08 Test and inspect installed systems

17.0 DEMONSTRATE PROFICIENCY IN INSTALLING IRRIGATION SYSTEMS--The student will be able to:

17.01 Explain the theory and procedures of landscape and commercial irrigation systems
17.02 Design, size, and lay out a landscape and/or commercial irrigation system
17.03 Select materials in accordance with given specifications
17.04 Lay out a job on site
17.05 Install distribution systems
17.06 Install equipment and controls
17.07 Test and inspect systems

18.0 DEMONSTRATE PROFICIENCY IN INSTALLING ROOF DRAINS AND LEADERS--The student will be able to:

18.01 Explain the theory of roof drains and leaders
18.02 Design, size and lay out systems
18.03 Select materials in accordance with specifications
18.04 Lay out a job on site
18.05 Install distribution systems
18.06 Install the roof drains and leaders
18.07 Test and inspect systems

19.0 DEMONSTRATE PROFICIENCY IN INSTALLING SOLAR HEATING SYSTEMS (OPTIONAL) --The student will be able to:

19.01 Explain the history and theory of solar heating
19.02 Identify various solar heating applications
19.03 Identify various materials used in solar heating
19.04 Design domestic solar water heating systems
19.05 Choose materials for domestic solar water heating systems
19.06 Lay out a job on site
19.07 Install transmission lines and low-voltage wiring
19.08 Install storage tanks
19.09 Install controls
19.10 Install safety devices
19.11 Install solar panels
19.12 Install controls at panels

19.13 Install safety devices at panels
19.14 Fill and test systems
19.15 Operate systems and adjust controls
19.16 Explain the operation and maintenance of systems to others, including freezing precautions

20.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

20.01 Conduct a job search
20.02 Secure information about a job
20.03 Identify documents that may be required when applying for a job
20.04 Complete a job application form correctly
20.05 Demonstrate competence in job interview techniques
20.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
20.07 Identify acceptable work habits
20.08 Demonstrate knowledge of how to make job changes appropriately
20.09 Demonstrate acceptable employee health habits

21.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

21.01 Define entrepreneurship
21.02 Describe the importance of entrepreneurship to the American economy
21.03 List the advantages and disadvantages of business ownership
21.04 Identify the risks involved in ownership of a business
21.05 Identify the necessary personal characteristics of a successful entrepreneur
21.06 Identify the business skills needed to operate a small business efficiently and effectively

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Residential Appliance and Refrigeration Repair

CODE NUMBER: Secondary 8706000 Postsecondary ______

Florida CIP 1N47.012600

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____ 7-9 _____ 9-12 _____ Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 10-12, 21

CERTIFICATION COVERAGE: WASH MACH @ 7 APPLI REPR 7
GAS FITTER 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as gas and electrical appliance repairers (50082005), all other mechanics and repairers (50083299), appliance installers (869.684-026), appliance servicers (637.261-018), gas stove servicer helpers (637.684-010), or window air conditioning installer helpers (637.687-101).

The content includes, but is not limited to skills to prepare individuals to repair, install and service major gas and electric consumer appliances as stoves, dryers, washers and dishwashers. Students who complete this program may gain additional training in this field by continuing their studies in major appliance and refrigeration repair at a postsecondary institution.

Listed below are the courses that comprise this program when offered at the secondary level:

8706010	Residential Appliance and Refrigeration Repair 1
8706020	Residential Appliance and Refrigeration Repair 2
8706030	Residential Appliance and Refrigeration Repair 3
8706040	Residential Appliance and Refrigeration Repair 4
8706050	Residential Appliance and Refrigeration Repair 5
8706060	Residential Appliance and Refrigeration Repair 6

II. LABORATORY ACTIVITIES: Laboratory activities are an integral part of this program including both gas and electric service in clothes dryers and ranges, basic refrigeration and tubing work.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply proper laboratory practices.
02. Apply electrical fundamentals.

Residential Appliance and Refrigeration Repair - Continued

03. Install, troubleshoot, and repair electric ranges.
04. Install, troubleshoot, and repair gas ranges.
05. Install, troubleshoot, and repair electric clothes dryers.
06. Install, troubleshoot, and repair gas clothes dryers.
07. Install, troubleshoot, and repair clothes washers.
08. Install, troubleshoot, and repair dishwashers.
09. Apply fundamentals of refrigeration.
10. Work with tubing and fittings.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
SECONDARY NUMBER: 8706000

PROGRAM TITLE: Residential Appliance and Refrigeration Repair
POSTSECONDARY NUMBER: ________

01.0 APPLY PROPER LABORATORY PRACTICES--The student will be able to:

01.01 Use industry accepted safety practices.
01.02 Explain appropriate first aid for electrical shock and potential shop accidents.
01.03 Perform appropriate recordkeeping functions.
01.04 Explain and demonstrate the proper use and care of hand tools.
01.05 Explain and demonstrate the proper use and care of meters and test equipment.
01.06 Explain and demonstrate the proper use and care of power tools.

02.0 APPLY ELECTRICAL FUNDAMENTALS--The student will be able to:

02.01 Explain electron theory.
02.02 Identify circuits from schematics and diagrams using commonly accepted symbols.
02.03 Explain Ohm's Law.
02.04 Measure resistance.
02.05 Measure voltage.
02.06 Measure amperage.
02.07 Measure wattage.
02.08 Explain and construct series circuits.
02.09 Explain and construct parallel circuits.
02.10 Explain and construct combination circuits.
02.11 Explain inductance and magnetism and their relationship to electric motors.
02.12 Describe how electric motors function.
02.13 Explain the function of capacitors and how to troubleshoot them.
02.14 Relays and switches.
02.15 Explain the function of capacitors and transformers in major appliances.
02.16 Explain the concept and rationale of motor protection.
02.17 Describe how a compressor functions.

03.0 INSTALL, TROUBLESHOOT, AND REPAIR ELECTRIC RANGES--The student will be able to:

03.01 Install an electric range.
03.02 Describe the operation and application of components.
03.03 Read and interpret schematics and diagrams.
03.04 Troubleshoot clocks/timers.
03.05 Remove and replace clocks/timers.
03.06 Troubleshoot surface unit switches and components.
03.07 Remove and replace surface switches or components.
03.08 Troubleshoot oven thermostats and components.
03.09 Remove and replace oven thermostats or components.
03.10 Troubleshoot oven selector switches and components.
03.11 Remove and replace oven selector switches or components.
03.12 Troubleshoot surface units and components.
03.13 Remove and replace surface units or components.
03.14 Troubleshoot bake and broil elements.
03.15 Remove and replace bake and broil elements.
03.16 Troubleshoot mullion heaters.
03.17 Remove and replace mullion heater.
03.18 Troubleshoot time delay relays.
03.19 Remove and replace time delay relay.
03.20 Troubleshoot oven sensors and components.
03.21 Remove and replace oven sensor or component.
03.22 Troubleshoot door locks or components.
03.23 Remove and replace door lock or component.
03.24 Troubleshoot fans.
03.25 Remove and replace fan.
03.26 Troubleshoot gaskets and seals.
03.27 Remove and replace Gasket or seal.
03.28 Perform operational check.
03.29 Instruct consumer on use and care.

04.0 INSTALL, TROUBLESHOOT, AND REPAIR GAS RANGES--The student will be able to:

04.01 Install a gas range.
04.02 Identify components and their function.
04.03 Read and interpret schematics and diagrams.
04.04 Troubleshoot clocks/timers.
04.05 Remove and replace clocks/timers.
04.06 Troubleshoot oven thermostats.
04.07 Remove and replace oven thermostats.
04.08 Troubleshoot oven selector switches.
04.09 Remove and replace oven selector switches.
04.10 Troubleshoot self-clean relays.
04.11 Remove and replace self-clean relays.
04.12 Troubleshoot oven sensors.
04.13 Remove and replace oven sensor.
04.14 Troubleshoot door locks.
04.15 Remove and replace door lock.
04.16 Troubleshoot fans.
04.17 Remove and replace fan.
04.18 Troubleshoot gas valves for surface burners.
04.19 Remove and replace gas valve for surface burner.
04.20 Troubleshoot gas valve for oven.
04.21 Remove and replace gas valve for oven.
04.22 Troubleshoot electric igniters.
04.23 Remove and replace electric igniter.
04.24 Troubleshoot safety valves.
04.25 Remove and replace safety valve.
04.26 Troubleshoot pressure regulators.
04.27 Remove and replace pressure regulator.
04.28 Troubleshoot door seals/gaskets.
04.29 Remove and replace door seal/gasket.
04.30 Perform operational check.
04.31 Instruct consumer on use and care.

05.0 INSTALL, TROUBLESHOOT, AND REPAIR ELECTRIC CLOTHES DRYER--The student will be able to:

05.01 Install an electric dryer.
05.02 Identify components and their function components.
05.03 Troubleshoot timers and components.
05.04 Remove and replace timer or component.
05.05 Troubleshoot drive motors and components.
05.06 Remove and replace drive motor or component.
05.07 Troubleshoot heating elements and components.
05.08 Remove and replace element or component.
05.09 Troubleshoot bearings and components.
05.10 Remove and replace bearing or component.
05.11 Troubleshoot belts and pulleys.
05.12 Remove and replace belt or pulley.
05.13 Troubleshoot rollers and glides.
05.14 Remove and replace roller or glides.
05.15 Troubleshoot filters.
05.16 Remove and replace filter.
05.17 Troubleshoot seals.
05.18 Remove and replace seals.
05.19 Troubleshoot push-to-start switch.
05.20 Remove and replace push-to-start switch.
05.21 Troubleshoot door switches.
05.22 Remove and replace door switch.
05.23 Troubleshoot selector switches.
05.24 Remove and replace selector switch.
05.25 Perform operational check.
05.25 Instruct consumer on use and care.

06.0 INSTALL, TROUBLESHOOT AND REPAIR GAS CLOTHES DRYERS--The student will be able to:

06.01 Install a gas dryer.
06.02 Identify components and their function.
06.03 Read and interpret schematics and diagrams.
06.04 Troubleshoot electric ignition components.
06.05 Remove and replace electric ignition components.
06.06 Troubleshoot timers and components.
06.07 Remove and replace timer or component.
06.08 Troubleshoot drive motors.
06.09 Remove and replace drive motor.

06.10 Troubleshoot gas burner.
06.11 Remove and replace gas burner.
06.12 Troubleshoot thermostats.
06.13 Remove and replace thermostat.
06.14 Troubleshoot gas valves.
06.15 Remove and replace gas valve.
06.16 Troubleshoot thermocouples.
06.17 Remove and replace thermocouple.
06.18 Troubleshoot flame switch.
06.19 Remove and replace flame switch.
06.20 Troubleshoot bearing assemblies and components.
06.21 Remove and replace bearing or component.
06.22 Troubleshoot belts and pulleys.
06.23 Remove and replace belt or pulley.
06.24 Troubleshoot rollers and glides.
06.25 Remove and replace roller or glide.
06.26 Troubleshoot seals.
06.27 Remove and replace seals.
06.28 Troubleshoot door switches.
06.29 Remove and replace door switch.
06.30 Troubleshoot selector switches.
06.31 Remove and replace selector switch.
06.32 Troubleshoot motor switches.
06.33 Remove and replace motor switch.
06.34 Perform operational check.
06.35 Instruct consumer on use and care.

07.0 INSTALL, TROUBLESHOOT AND REPAIR CLOTHES WASHERS--The student will be able to:

07.01 Install a clothes washer.
07.02 Identify components and their function.
07.03 Read and interpret schematics and diagrams.
07.04 Troubleshoot timers and components.
07.05 Remove and replace timer or component.
07.06 Troubleshoot selector switches.
07.07 Remove and replace selector switch.
07.08 Troubleshoot water level switches and components.
07.09 Remove and replace water level switch or component.
07.10 Troubleshoot water inlet valves and components.
07.11 Remove and replace water inlet valve or component.
07.12 Troubleshoot hoses.
07.13 Remove and replace hoses.
07.14 Troubleshoot water pumps and components.
07.15 Remove and replace water pump or component.
07.16 Troubleshoot filters.
07.17 Remove and replace filter.
07.18 Troubleshoot drive motors and components.
07.19 Remove and replace drive motor or component.
07.20 Troubleshoot belts and pulleys.
07.21 Remove and replace belt or pulley.
07.22 Troubleshoot transmissions and components.
07.23 Remove and replace transmission or component.
07.24 Troubleshoot bearings.
07.25 Remove and replace bearings.
07.26 Troubleshoot water and oil seals.
07.27 Remove and replace water and oil seals.
07.28 Troubleshoot clutches.
07.29 Remove and replace clutch.
07.30 Troubleshoot brakes.
07.31 Remove and replace brake.
07.32 Troubleshoot lid switches and components.
07.33 Remove and replace lid switch or component.
07.34 Perform operational check.
07.35 Instruct consumer on use and care.

08.0 INSTALL, TROUBLESHOOT, AND REPAIR DISHWASHERS--The student will be able to:

08.01 Install a dishwasher.
08.02 Identify components and their function.
08.03 Read and interpret schematics and diagrams.
08.04 Troubleshoot timers and components.
08.05 Remove and replace timer or component.
08.06 Troubleshoot selector switches.
08.07 Remove and replace selector switch.
08.08 Troubleshoot float switches.

08.09 Remove and replace float switch.
08.10 Troubleshoot door switches.
08.11 Remove and replace door switch.
08.12 Troubleshoot motors and components.
08.13 Remove and replace motor and component.
08.14 Troubleshoot heating elements.
08.15 Remove and replace heating element.
08.16 Troubleshoot relays.
08.17 Remove and replace relay.
08.18 Troubleshoot water valves and components.
08.19 Remove and replace water valve or component.
08.20 Troubleshoot hoses.
08.21 Remove and replace hoses.
08.22 Troubleshoot pumps and components.
08.23 Remove and replace pump or component.
08.24 Troubleshoot seals.
08.25 Remove and replace seals.
08.26 Troubleshoot dispensers and components.
08.27 Remove and replace dispenser or component.
08.28 Troubleshoot spray arms.
08.29 Remove and replace spray arm.
08.30 Troubleshoot blower motors.
08.31 Remove and replace blower motor.
08.32 Troubleshoot thermostats.
08.33 Remove and replace thermostat.
08.34 Perform operational check.
08.35 Instruct consumer on use and care.

09.0 UTILIZE THE FUNDAMENTALS OF REFRIGERATION--The student will be able to:

09.01 Explain commonly used terms.
09.02 Perform heat transfer, measuring and temperature conversions.
09.03 Perform pressure measuring and conversion calculations.
09.04 Explain the concept of state of matter.
09.05 Explain the differences in refrigerants and their uses.
09.06 Diagram and explain the functions of the components of basic refrigeration systems.
09.07 Remove, repair and replace compressors.
09.08 Remove, replace and service condensors, evaporators and driers.
09.09 Use metering devices to determine operating condition of a refrigeration system.
09.10 Troubleshoot and repair defective refrigeration systems.

10.0 WORK WITH TUBING AND FITTINGS--The student will be able to:

10.01 Identify types and sizes of tubing and fittings.
10.02 Measure, cut, flare, swage and bend tubing.
10.03 Soft solder with acetylene.
10.04 Braze with acetylene and oxyacetylene.
10.05 Fabricate replacement sections of tubing for appliances.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.

12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Residential Appliance and Refrigeration Repair

PROGRAM NUMBER: 8706000

COURSE TITLE: Residential Appliance and Refrigeration Repair 1

COURSE NUMBER: 8706010

COURSE DESCRIPTION:

This course is designed to present safety and first aid for the lab environment. Also the identification, use and care of hand and power tools will be presented. Brazing and soldering techniques, as well as working with tubing, will be presented.

01.0 APPLY PROPER LABORATORY PRACTICES--The student will be able to:

01.01 Use industry accepted safety practices.
01.02 Explain appropriate first aid for electrical shock and potential shop accidents.
01.03 Perform appropriate recordkeeping functions.
01.04 Explain and demonstrate the proper use and care of hand tools.
01.05 Explain and demonstrate the proper use and care of meters and test equipment.
01.06 Explain and demonstrate the proper use and care of power tools.

10.0 WORK WITH TUBING AND FITTINGS--The student will be able to:

10.01 Identify types and sizes of tubing and fittings.
10.02 Measure, cut, flare, swage and bend tubing.
10.03 Soft solder with acetylene.
10.04 Braze with acetylene and oxyacetylene.
10.05 Fabricate replacement sections of tubing for appliances.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Residential Appliance and Refrigeration Repair

PROGRAM NUMBER: 8706000

COURSE TITLE: Residential Appliance and Refrigeration Repair 2

COURSE NUMBER: 8706020

COURSE DESCRIPTION:

This course will teach basic concepts of electricity and electrical circuits, their component parts, and theory of operation including Ohm's law. Basic concepts of transformers, electric motors and capacitors will be presented.

02.0 APPLY ELECTRICAL FUNDAMENTALS--The student will be able to:

02.01 Explain electron theory.
02.02 Identify circuits from schematics and diagrams using commonly accepted symbols.
02.03 Explain Ohm's Law.
02.04 Measure resistance.
02.05 Measure voltage.
02.06 Measure amperage.
02.07 Measure wattage.
02.08 Explain and construct series circuits.
02.09 Explain and construct parallel circuits.
02.10 Explain and construct combination circuits.
02.11 Explain inductance and magnetism and their relationship to electric motors.
02.12 Describe how electric motors function.
02.13 Explain the function of capacitors and how to troubleshoot them.
02.14 Relays and switches.
02.15 Explain the function of capacitors and transformers in major appliances.
02.16 Explain the concept and rationale of motor protection.
02.17 Describe how a compressor functions.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Residential Appliance and Refrigeration Repair

PROGRAM NUMBER: 8706000

COURSE TITLE: Residential Appliance and Refrigeration Repair 3

COURSE NUMBER: 8706030

COURSE DESCRIPTION:

This course teaches the skills necessary to install, troubleshoot and repair, electric ranges and clothes dryers. Techniques to instruct the consumer on the proper operation of these appliances will be presented.

03.0 INSTALL, TROUBLESHOOT, AND REPAIR ELECTRIC RANGES--The student will be able to:

03.01 Install an electric range.
03.02 Describe the operation and application of components.
03.03 Read and interpret schematics and diagrams.
03.04 Troubleshoot clocks/timers.
03.05 Remove and replace clocks/timers.
03.06 Troubleshoot surface unit switches and components.
03.07 Remove and replace surface switches or components.
03.08 Troubleshoot oven thermostats and components.
03.09 Remove and replace oven thermostats or components.
03.10 Troubleshoot oven selector switches and components.
03.11 Remove and replace oven selector switches or components.
03.12 Troubleshoot surface units and components.
03.13 Remove and replace surface units or components.
03.14 Troubleshoot bake and broil elements.
03.15 Remove and replace bake and broil elements.
03.16 Troubleshoot mullion heaters.
03.17 Remove and replace mullion heater.
03.18 Troubleshoot time delay relays.
03.19 Remove and replace time delay relay.
03.20 Troubleshoot oven sensors and components.
03.21 Remove and replace oven sensor or component.
03.22 Troubleshoot door locks or components.
03.23 Remove and replace door lock or component.
03.24 Troubleshoot fans.
03.25 Remove and replace fan.
03.26 Troubleshoot gaskets and seals.
03.27 Remove and replace Gasket or seal.
03.28 Perform operational check.
03.29 Instruct consumer on use and care.

05.0 INSTALL, TROUBLESHOOT, AND REPAIR ELECTRIC CLOTHES DRYER--The student will be able to:

05.01 Install an electric dryer.
05.02 Identify components and their function components.
05.03 Troubleshoot timers and components.
05.04 Remove and replace timer or component.
05.05 Troubleshoot drive motors and components.
05.06 Remove and replace drive motor or component.
05.07 Troubleshoot heating elements and components.
05.08 Remove and replace element or component.
05.09 Troubleshoot bearings and components.
05.10 Remove and replace bearing or component.
05.11 Troubleshoot belts and pulleys.
05.12 Remove and replace belt or pulley.
05.13 Troubleshoot rollers and glides.
05.14 Remove and replace roller or glides.
05.15 Troubleshoot filters.
05.16 Remove and replace filter.
05.17 Troubleshoot seals.
05.18 Remove and replace seals.
05.19 Troubleshoot push-to-start switch.
05.20 Remove and replace push-to-start switch.
05.21 Troubleshoot door switches.
05.22 Remove and replace door switch.
05.23 Troubleshoot selector switches.
05.24 Remove and replace selector switch.
05.25 Perform operational check.
05.25 Instruct consumer on use and care.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Residential Appliance and Refrigeration Repair
PROGRAM NUMBER: 8706000

COURSE TITLE: Residential Appliance and Refrigeration Repair 4
COURSE NUMBER: 8706040

COURSE DESCRIPTION:

This course will include the hands-on performance of installation, troubleshooting and repair of residential clothes washers, refrigerators and dishwashers.

07.0 INSTALL, TROUBLESHOOT AND REPAIR CLOTHES WASHERS--The student will be able to:

07.01 Install a clothes washer.
07.02 Identify components and their function.
07.03 Read and interpret schematics and diagrams.
07.04 Troubleshoot timers and components.
07.05 Remove and replace timer or component.
07.06 Troubleshoot selector switches.
07.07 Remove and replace selector switch.
07.08 Troubleshoot water level switches and components.
07.09 Remove and replace water level switch or component.
07.10 Troubleshoot water inlet valves and components.
07.11 Remove and replace water inlet valve or component.
07.12 Troubleshoot hoses.
07.13 Remove and replace hoses.
07.14 Troubleshoot water pumps and components.
07.15 Remove and replace water pump or component.
07.16 Troubleshoot filters.
07.17 Remove and replace filter.
07.18 Troubleshoot drive motors and components.
07.19 Remove and replace drive motor or component.
07.20 Troubleshoot belts and pulleys.
07.21 Remove and replace belt or pulley.
07.22 Troubleshoot transmissions and components.
07.23 Remove and replace transmission or component.
07.24 Troubleshoot bearings.
07.25 Remove and replace bearings.
07.26 Troubleshoot water and oil seals.
07.27 Remove and replace water and oil seals.
07.28 Troubleshoot clutches.
07.29 Remove and replace clutch.
07.30 Troubleshoot brakes.
07.31 Remove and replace brake.
07.32 Troubleshoot lid switches and components.
07.33 Remove and replace lid switch or component.
07.34 Perform operational check.
07.35 Instruct consumer on use and care.

08.0 INSTALL, TROUBLESHOOT, AND REPAIR DISHWASHERS--The student will be able to:

08.01 Install a dishwasher.
08.02 Identify components and their function.
08.03 Read and interpret schematics and diagrams.
08.04 Troubleshoot timers and components.
08.05 Remove and replace timer or component.
08.06 Troubleshoot selector switches.
08.07 Remove and replace selector switch.
08.08 Troubleshoot float switches.
08.09 Remove and replace float switch.
08.10 Troubleshoot door switches.
08.11 Remove and replace door switch.
08.12 Troubleshoot motors and components.
08.13 Remove and replace motor and component.
08.14 Troubleshoot heating elements.
08.15 Remove and replace heating element.
08.16 Troubleshoot relays.
08.17 Remove and replace relay.
08.18 Troubleshoot water valves and components.
08.19 Remove and replace water valve or component.
08.20 Troubleshoot hoses.

08.21 Remove and replace hoses.
08.22 Troubleshoot pumps and components.
08.23 Remove and replace pump or component.
08.24 Troubleshoot seals.
08.25 Remove and replace seals.
08.26 Troubleshoot dispensers and components.
08.27 Remove and replace dispenser or component.
08.28 Troubleshoot spray arms.
08.29 Remove and replace spray arm.
08.30 Troubleshoot blower motors.
08.31 Remove and replace blower motor.
08.32 Troubleshoot thermostats.
08.33 Remove and replace thermostat.
08.34 Perform operational check.
08.35 Instruct consumer on use and care.

09.0 UTILIZE THE FUNDAMENTALS OF REFRIGERATION--The student will be able to:

09.01 Explain commonly used terms.
09.02 Perform heat transfer, measuring and temperature conversions.
09.03 Perform pressure measuring and conversion calculations.
09.04 Explain the concept of state of matter.
09.05 Explain the differences in refrigerants and their uses.
09.06 Diagram and explain the functions of the components of basic refrigeration systems.
09.07 Remove, repair and replace compressors.
09.08 Remove, replace and service condensors, evaporators and driers.
09.09 Use metering devices to determine operating condition of a refrigeration system.
09.10 Troubleshoot and repair defective refrigeration systems.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Residential Appliance and Refrigeration Repair

PROGRAM NUMBER: 8706000

COURSE TITLE: Residential Appliance and Refrigeration Repair 5

COURSE NUMBER: 8706050

COURSE DESCRIPTION:

This course is designed for component identification, troubleshooting and repair of residential gas ranges and clothes dryers.

04.0 INSTALL, TROUBLESHOOT, AND REPAIR GAS RANGES--The student will be able to:

04.01 Install a gas range.
04.02 Identify components and their function.
04.03 Read and interpret schematics and diagrams.
04.04 Troubleshoot clocks/timers.
04.05 Remove and replace clocks/timers.
04.06 Troubleshoot oven thermostats.
04.07 Remove and replace oven thermostats.
04.08 Troubleshoot oven selector switches.
04.09 Remove and replace oven selector switches.
04.10 Troubleshoot self-clean relays.
04.11 Remove and replace self-clean relays.
04.12 Troubleshoot oven sensors.
04.13 Remove and replace oven sensor.
04.14 Troubleshoot door locks.
04.15 Remove and replace door lock.
04.16 Troubleshoot fans.
04.17 Remove and replace fan.
04.18 Troubleshoot gas valves for surface burners.
04.19 Remove and replace gas valve for surface burner.
04.20 Troubleshoot gas valve for oven.
04.21 Remove and replace gas valve for oven.
04.22 Troubleshoot electric igniters.
04.23 Remove and replace electric igniter.
04.24 Troubleshoot safety valves.
04.25 Remove and replace safety valve.

04.26 Troubleshoot pressure regulators.
04.27 Remove and replace pressure regulator.
04.28 Troubleshoot door seals/gaskets.
04.29 Remove and replace door seal/gasket.
04.30 Perform operational check.
04.31 Instruct consumer on use and care.

06.0 INSTALL, TROUBLESHOOT AND REPAIR GAS CLOTHES DRYERS--The student will be able to:

06.01 Install a gas dryer.
06.02 Identify components and their function.
06.03 Read and interpret schematics and diagrams.
06.04 Troubleshoot electric ignition components.
06.05 Remove and replace electric ignition components.
06.06 Troubleshoot timers and components.
06.07 Remove and replace timer or component.
06.08 Troubleshoot drive motors.
06.09 Remove and replace drive motor.
06.10 Troubleshoot gas burner.
06.11 Remove and replace gas burner.
06.12 Troubleshoot thermostats.
06.13 Remove and replace thermostat.
06.14 Troubleshoot gas valves.
06.15 Remove and replace gas valve.
06.16 Troubleshoot thermocouples.
06.17 Remove and replace thermocouple.
06.18 Troubleshoot flame switch.
06.19 Remove and replace flame switch.
06.20 Troubleshoot bearing assemblies and components.
06.21 Remove and replace bearing or component.
06.22 Troubleshoot belts and pulleys.
06.23 Remove and replace belt or pulley.
06.24 Troubleshoot rollers and glides.
06.25 Remove and replace roller or glide.
06.26 Troubleshoot seals.
06.27 Remove and replace seals.
06.28 Troubleshoot door switches.
06.29 Remove and replace door switch.
06.30 Troubleshoot selector switches.
06.31 Remove and replace selector switch.
06.32 Troubleshoot motor switches.
06.33 Remove and replace motor switch.
06.34 Perform operational check.
06.35 Instruct consumer on use and care.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial

COURSE CREDIT: 1

PROGRAM TITLE: Residential Appliance and Refrigeration Repair

PROGRAM NUMBER: 8706000

COURSE TITLE: Residential Appliance and Refrigeration Repair 6

COURSE NUMBER: 8706060

COURSE DESCRIPTION:

This course is designed to instruct the student in the preparation of job applications and resumes. Also to enhance the student in additional lab activities as selected by the instructor.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of making job changes appropriately.
11.09 Demonstrate acceptable employee health habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Residential Carpentry

CODE NUMBER: Secondary 8721600 Postsecondary ______

Florida CIP IN46.021100

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ______7-9 ______9-12 ______Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 10-12, 21

CERTIFICATION COVERAGE: TEC CONSTR @ 7 CARPENTRY 7 BLDG CONST @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as carpenters (50020201), carpenter helpers (869.664-014), rough carpenters (860.381-042), or maintenance carpenters (860.281-010).

The content includes, but is not limited to, communication skills; leadership skills; human relations and employability skills; safe and efficient work practices; industry standards and practices; laying out, fabricating, erecting, installing, and repairing residential wooden structures and fixtures using hand and power tools.

Listed below are the courses that comprise this program when offered at the secondary level:

8721610	Residential Carpentry 1
8721620	Residential Carpentry 2
8721630	Residential Carpentry 3
8721640	Residential Carpentry 4
8721650	Residential Carpentry 5
8721660	Residential Carpentry 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in material selection; use and care of hand tools, power tools and equipment; selection and use of materials, estimating, and blueprint reading to construct common systems of residential framing.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate proficiency in safety and first aid practices.
02. Convey knowledge and identify values of the construction industry.
03. Demonstrate knowledge of basic mathematics for carpentry.
04. Read blueprints.
05. Use hand tools.
06. Identify the characteristics of construction lumber.
07. Use power tools.
08. Use woodworking machines.
09. Demonstrate knowledge in site preparation and layout.
10. Set up and use the transit and builders level.
11. Demonstrate proper handling and storage of materials.
12. Demonstrate knowledge of form construction.
13. Cut and install framing members for a floor.
14. Cut and install of wall and partition framing.
15. Frame roofs.
16. Construct and install roof trusses.
17. Install exterior wall covering and trim.
18. Install interior and exterior doors.
19. Install windows.
20. Install interior dry wall materials.
21. Perform stair and step layout and construction.
22. Install paneling, furring strips, and ceilings.
23. Install insulation and sound control materials.
24. Install cabinets and shelving.
25. Demonstrate knowledge of free enterprise system.
26. Demonstrate employability skills.
27. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
SECONDARY NUMBER: 8721600
PROGRAM TITLE: Residential Carpentry
POSTSECONDARY NUMBER: ________

01.0 DEMONSTRATE PROFICIENCY IN SAFETY AND FIRST AID PRACTICES--The student will be able to:

01.01 Demonstrate the ability to work safely.
01.02 Demonstrate the ability to keep a clean, orderly and safety work area.
01.03 Operate a fire extinguisher
01.04 Qualify in and apply basic first aid procedures.
01.05 Demonstrate safe use of hand and power tools.
01.06 Recognize and identify common safety hazards.

02.0 CONVEY KNOWLEDGE AND IDENTIFY VALUES OF THE CONSTRUCTION INDUSTRY--The student will be able to:

02.01 Interpret the importance of the construction industry to the national economy.
02.02 Identify the employment opportunities in the construction industry.

03.0 DEMONSTRATE KNOWLEDGE OF BASIC MATHEMATICS FOR CARPENTRY--The student will be able to:

03.01 Read and interpret measuring devices (rules and tapes.)
03.02 Add 100 combinations.
03.03 Add two-digit and three-digit numbers.
03.04 Subtract 100 subtraction combinations.
03.05 Subtract two-, three- and four-digit numbers.
03.06 Solve one-digit and two-digit divisor problems.
03.07 Solve two- and three-digit divisor problems.
03.08 Solve multiplication problems of one- and two-digit factors.
03.09 Identify parts of a fraction.
03.10 Identify and solve fractional word problems.
03.11 Classify types of fractions.
03.12 Illustrate equivalent fractions.
03.13 Convert fractions and reduce fractions.
03.14 Solve decimal notations.
03.15 Solve number word problems.
03.16 Round to the nearest whole number.
03.17 Add, subtract, multiply, and divide decimals.
03.18 Divide a whole number by a decimal.
03.19 Write fractions as decimals and percents.
03.20 Write percents as fractions and decimals
03.21 Solve percent problems.
03.22 Compute board feet for cost of materials.
03.23 Calculate amount of wire mesh for a job.
03.24 Solve basic ratio and proportion problems.
03.25 Operate simple hand-held calculators.
03.26 Convert board feet to linear feet and vice versa.
03.27 Read, interpret and apply metric conversion.

04.0 READ BLUEPRINTS--The student will be able to:

04.01 Read architect's rule using all scales.
04.02 Read engineer's rule using all scales.
04.03 Identify architectural elevators and schedules.
04.04 Identify lines, mechanical, electrical, and topographical symbols.
04.05 Read and interpret blueprints and specifications.

05.0 USE HAND TOOLS--The student will be able to:

05.01 Identify hand tools.
05.02 Select correct tool according to job.
05.03 Demonstrate safe and proper care and use of hand tools.

06.0 IDENTIFY CHARACTERISTICS OF CONSTRUCTION LUMBER--The student will be able to:

06.01 Identify the grades and species of lumber.
06.02 Identify the actual and nominal sizes.
06.03 Identify grades of plywood.

07.0 USE POWER TOOLS--The student will be able to:

07.01 Identify power tools.
07.02 Select the correct power tool according to the job.
07.03 Demonstrate safe and proper use and care of power tools.

08.0 USE WOODWORKING MACHINES--The student will be able to:

08.01 Identify woodworking machines.
08.02 Demonstrate safe and proper use and care of woodworking machines.

09.0 DEMONSTRATE KNOWLEDGE IN SITE PREPARATION AND LAYOUT--The student will be able to:

09.01 Identify building layout.
09.02 Erect batter boards and locate building lines.
09.03 Locate building line points on batter boards using a building level.
09.04 Locate building lines on a plot plan from a set of datum.
09.05 Lay out a building using batter boards.
09.06 Square a building using the 3-4-5 rule.
09.07 Square a building using the diagonal method.

10.0 SET UP AND USE THE TRANSIT AND BUILDER'S LEVEL--The student will be able to:

10.01 Set up and adjust the builder's level.
10.02 Set up and adjust transit over-point and establish lines with two-points.
10.03 Read the self-reading rod (positive reading and direct reading.)
10.04 Perform differential leveling jobs.
10.05 Use transits.
10.06 Use builder's levels.

11.0 DEMONSTRATE KNOWLEDGE OF PROPER HANDLING AND STORAGE OF MATERIALS--The student will be able to:

11.01 Receive material and store properly at job site.
11.02 Identify defects and blemishes that affect durability and strength of lumber.
11.03 Strip wood, patented and metal and fiberglass forms.
11.04 Handle material safely in order to avoid damage to yourself or the material.
11.05 Attach accessories for load lifting.
11.06 Attach types of hitches for load lifting.
11.07 Tie types of knots used in rigging.

12.0 DEMONSTRATE KNOWLEDGE OF FORM CONSTRUCTION--The student will be able to:

12.01 Identify the parts of a form.
12.02 Identify types of forms.
12.03 Install inbeds for various forms.
12.04 Identify styles of footings.
12.05 Construct and set forms for a continuous form.
12.06 Construct and set forms for a pile cap.
12.07 Construct and set a pier footing form.
12.08 Strip a pier footing form and prepare it for erection at another location.

13.0 CUT AND INSTALL FRAMING MEMBERS FOR A FLOOR--The student will be able to:

13.01 Identify framing members.
13.02 Build box sill and install floor joist.
13.03 Install bridging.
13.04 Lay subfloor.
13.05 Install floor joists for cantilever floor.

14.0 CUT AND INSTALL OF WALL AND PARTITION FRAMING--The student will be able to:

14.01 Identify framing members used in wall and partition construction.
14.02 Identify types of partitions "T's".
14.03 Lay out wall and partition locations on floor.
14.04 Cut studs, trimmers, cripples and headers to length.
14.05 Cut fire stops.
14.06 Build "T's", corners and headers.

14.07 Lay out and assemble wall sections.
14.08 Install sheating.
14.09 Lay out and install ceiling joists.

15.0 FRAME ROOFS--The student will be able to:

15.01 Identify roofing members.
15.02 Identify roofing styles.
15.03 Identify roof framing units.
15.04 Compute length of common rafters.
15.05 Compute length of hip rafters.
15.06 Compute length of jack rafters.
15.07 Lay out rafter location on plate and ridge on two-foot centers.
15.08 Lay out, cut and erect rafters.
15.09 Apply roof sheathing.
15.10 Install asphalt-composition strip shingles.

16.0 CONSTRUCT AND INSTALL ROOF TRUSSES--The student will be able to:

16.01 Identify main parts trusses.
16.02 Identify pieces of hardware used in truss construction.
16.03 Brace trusses.
16.04 Install trusses.

17.0 INSTALL EXTERIOR COVERING AND TRIM--The student will be able to:

17.01 Identify styles of cornice.
17.02 Identify types of cornice molding.
17.03 Identify styles of siding.
17.04 Build a box cornice.
17.05 Install siding and trim.

18.0 INSTALL EXTERIOR DOORS--The student will be able to:

18.01 Install exterior door frames and hang doors.
18.02 Identify parts of door frame.
18.03 Install door hardware.

19.0 INSTALL WINDOWS--The student will be able to:

19.01 Identify parts of window unit.
19.02 Install window units.

20.0 INSTALL INTERIOR DRY WALL MATERIALS--The student will be able to:

20.01 Install gypsum wallboard.
20.02 Apply laminated gypsum wallboard.

21.0 PERFORM STAIR AND STEP LAYOUT AND CONSTRUCTION--The student will be able to:

21.01 Identify parts of staircase.
21.02 Calculate the number of risers and treads for a stair.
21.03 Lay out, cut and assemble a stair (rough and finish.)

22.0 INSTALL PANELING, FURRING STRIPS, AND CEILINGS--The student will be able to:

22.01 Install paneling.
22.02 Install ceiling materials.
22.03 Install furring strips.

23.0 INSTALL INSULATION AND SOUND CONTROL MATERIALS--The student will be able to:

23.01 Install rigid insulation material.

24.0 INSTALL CABINETS AND SHELVING--The student will be able to:

24.01 Identify parts of cabinet or fixture.
24.02 Identify types of cabinet door installations.
24.03 Identify cabinet hardware.
24.04 Install cabinet hardware.

24.05 Install custom-built cabinet.
24.06 Install fixtures.
24.07 Install shelving.

25.0 DEMONSTRATE KNOWLEDGE OF FREE ENTERPRISE SYSTEMS--The student will be able to:

25.01 State the importance of the free enterprise system to the economy.
25.02 State the role of the construction industry within the free enterprise system.

26.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

26.01 Conduct a job search.
26.02 Secure information about a job.
26.03 Identify documents which may be required when applying for a job interview.
26.04 Complete a job application form correctly.
26.05 Demonstrate competence in job interview techniques.
26.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
26.07 Identify acceptable work habits.
26.08 Demonstrate knowledge of how to make job changes appropriately.
26.09 Demonstrate acceptable employee health habits.

27.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

27.01 Define entrepreneurship.
27.02 Describe the importance of entrepreneurship to the American economy.
27.03 List the advantages and disadvantages of business ownership.
27.04 Identify the risks involved in ownership of a business.
27.05 Identify the necessary personal characteristics of a successful entrepreneur.
27.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS | EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial | COURSE CREDIT: 1

PROGRAM TITLE: Residential Carpentry | PROGRAM NUMBER: 8721600

COURSE TITLE: Residential Carpentry 1 | COURSE NUMBER: 8721610

COURSE DESCRIPTION:

This course is designed to provide instruction in the safety practices and procedures relating to the use, care, and identification of hand tools, portable power tools, and woodworking machines, the precautions of working with job related materials, chemicals and electricity. First aid, emergency procedures, career opportunities, and identification of various types of wood are also included.

01.0 DEMONSTRATE PROFICIENCY IN SAFETY AND FIRST AID PRACTICES--The student will be able to:

01.01 Demonstrate the ability to work safely.
01.02 Demonstrate the ability to keep a clean, orderly and safe work area.
01.03 Operate a fire extinguisher
01.04 Qualify in and apply basic first aid procedures.
01.05 Demonstrate safe use of hand and power tools.
01.06 Recognize and identify common safety hazards.

02.0 CONVEY KNOWLEDGE AND IDENTIFY VALUES OF THE CONSTRUCTION INDUSTRY--The student will be able to:

02.01 Interpret the importance of the construction industry to the national economy.
02.02 Identify the employment opportunities in the construction industry.

05.0 USE HAND TOOLS--The student will be able to:

05.01 Identify hand tools.
05.02 Select correct tool according to job.
05.03 Demonstrate safe and proper care and use of hand tools.

06.0 IDENTIFY CHARACTERISTICS OF CONSTRUCTION LUMBER--The student will be able to:

06.01 Identify the grades and species of lumber.
06.02 Identify the actual and nominal sizes.
06.03 Identify grades of plywood.

07.0 USE POWER TOOLS--The student will be able to:

07.01 Identify power tools.
07.02 Select the correct power tool according to the job.
07.03 Demonstrate safe and proper use and care of power tools.

08.0 USE WOODWORKING MACHINES--The student will be able to:

08.01 Identify woodworking machines.
08.02 Demonstrate safe and proper use and care of woodworking machines.

STUDENT PERFORMANCE STANDARDS | EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial | COURSE CREDIT: 1

PROGRAM TITLE: Residential Carpentry | PROGRAM NUMBER: 8721600

COURSE TITLE: Residential Carpentry 2 | COURSE NUMBER: 8721620

COURSE DESCRIPTION:

This course is designed to provide instruction in the identification and use of drawings found in a set of blueprints, scale of measurements and symbols used by architects and related math skills for material and cost estimating.

03.0 DEMONSTRATE KNOWLEDGE OF BASIC MATHEMATICS FOR CARPENTRY--The student will be able to:

03.01 Read and interpret measuring devices (rules and tapes.)
03.02 Add 100 combinations.
03.03 Add two-digit and three-digit numbers.
03.04 Subtract 100 subtraction combinations.
03.05 Subtract two-, three- and four-digit numbers.
03.06 Solve one-digit and two-digit divisor problems.
03.07 Solve two- and three-digit divisor problems.
03.08 Solve multiplication problems of one- and two-digit factors.
03.09 Identify parts of a fraction.
03.10 Identify and solve fractional word problems.
03.11 Classify types of fractions.
03.12 Illustrate equivalent fractions.
03.13 Convert fractions and reduce fractions.
03.14 Solve decimal notations.
03.15 Solve number word problems.
03.16 Round to the nearest whole number.
03.17 Add, subtract, multiply, and divide decimals.
03.18 Divide a whole number by a decimal.
03.19 Write fractions as decimals and percents.
03.20 Write percents as fractions and decimals
03.21 Solve percent problems.
03.22 Compute board feet for cost of materials.
03.23 Calculate amount of wire mesh for a job.
03.24 Solve basic ratio and proportion problems.
03.25 Operate simple hand-held calculators.
03.26 Convert board feet to linear feet and vice versa.
03.27 Read, interpret and apply metric conversion.

04.0 READ BLUEPRINTS--The student will be able to:

04.01 Read architect's rule using all scales.
04.02 Read engineer's rule using all scales.
04.03 Identify architectural elevators and schedules.
04.04 Identify lines, mechanical, electrical, and topographical symbols.
04.05 Read and interpret blueprints and specifications.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Residential Carpentry
PROGRAM NUMBER: 8721600

COURSE TITLE: Residential Carpentry 3
COURSE NUMBER: 8721630

COURSE DESCRIPTION:

This course is designed to provide instruction in site planning, preparation and layout, use and care of the builder transit-level, techniques in locating the structure construction and location of batter boards, and the practical application of concrete form fabrication methods and techniques used in residential buildings.

09.0 DEMONSTRATE KNOWLEDGE IN SITE PREPARATION AND LAYOUT--The student will be able to:

09.01 Identify building layout.
09.02 Erect batter boards and locate building lines.
09.03 Locate building line points on batter boards using a building level.
09.04 Locate building lines on a plot plan from a set of datum.
09.05 Lay out a building using batter boards.
09.06 Square a building using the 3-4-5 rule.
09.07 Square a building using the diagonal method.

10.0 SET UP AND USE THE TRANSIT AND BUILDER'S LEVEL--The student will be able to:

10.01 Set up and adjust the builder's level.
10.02 Set up and adjust transit over-point and establish lines with two-points.
10.03 Read the self-reading rod (positive reading and direct reading.)
10.04 Perform differential leveling jobs.
10.05 Use transits.
10.06 Use builder's levels.

11.0 DEMONSTRATE KNOWLEDGE OF PROPER HANDLING AND STORAGE OF MATERIALS--The student will be able to:

11.01 Receive material and store properly at job site.
11.02 Identify defects and blemishes that affect durability and strength of lumber.
11.03 Strip wood, patented and metal and fiberglass forms.
11.04 Handle material safely in order to avoid damage to yourself or the material.
11.05 Attach accessories for load lifting.
11.06 Attach types of hitches for load lifting.
11.07 Tie types of knots used in rigging.

12.0 DEMONSTRATE KNOWLEDGE OF FORM CONSTRUCTION--The student will be able to:

12.01 Identify the parts of a form.
12.02 Identify types of forms.
12.03 Install inbeds for various forms.
12.04 Identify styles of footings.
12.05 Construct and set forms for a continuous form.
12.06 Construct and set forms for a pile cap.
12.07 Construct and set a pier footing form.
12.08 Strip a pier footing form and prepare it for erection at another location.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Residential Carpentry — PROGRAM NUMBER: 8721600

COURSE TITLE: Residential Carpentry 4 — COURSE NUMBER: 8721640

COURSE DESCRIPTION:

This course is designed to provide instruction in the methods and techniques of framing floors, walls, and roofs including roof trusses, application of exterior doors and window, siding, trim, and wall coverings.

13.0 CUT AND INSTALL FRAMING MEMBERS FOR A FLOOR--The student will be able to:

13.01 Identify framing members.
13.02 Build box sill and install floor joist.
13.03 Install bridging.
13.04 Lay subfloor.
13.05 Install floor joists for cantilever floor.

14.0 CUT AND INSTALL OF WALL AND PARTITION FRAMING--The student will be able to:

14.01 Identify framing members used in wall and partition construction.
14.02 Identify types of partitions "T's".
14.03 Lay out wall and partition locations on floor.
14.04 Cut studs, trimmers, cripples and headers to length.
14.05 Cut fire stops.

14.06 Build "T's", corners and headers.
14.07 Lay out and assemble wall sections.
14.08 Install sheating.
14.09 Lay out and install ceiling joists.

15.0 FRAME ROOFS--The student will be able to:

15.01 Identify roofing members.
15.02 Identify roofing styles.
15.03 Identify roof framing units.
15.04 Compute length of common rafters.
15.05 Compute length of hip rafters.
15.06 Compute length of jack rafters.
15.07 Lay out rafter location on plate and ridge on two-foot centers.
15.08 Lay out, cut and erect rafters.
15.09 Apply roof sheathing.
15.10 Install asphalt-composition strip shingles.

16.0 CONSTRUCT AND INSTALL ROOF TRUSSES--The student will be able to:

16.01 Identify main parts trusses.
16.02 Identify pieces of hardware used in truss construction.
16.03 Brace trusses.
16.04 Install trusses.

17.0 INSTALL EXTERIOR COVERING AND TRIM--The student will be able to:

17.01 Identify styles of cornice.
17.02 Identify types of cornice molding.
17.03 Identify styles of siding.
17.04 Build a box cornice.
17.05 Install siding and trim.

18.0 INSTALL EXTERIOR DOORS--The student will be able to:

18.01 Install exterior door frames and hang doors.
18.02 Identify parts of door frame.
18.03 Install door hardware.

19.0 INSTALL WINDOWS--The student will be able to:

19.01 Identify parts of window unit.
19.02 Install window units.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Residential Carpentry
PROGRAM NUMBER: 8721600

COURSE TITLE: Residential Carpentry 5
COURSE NUMBER: 8721650

COURSE DESCRIPTION:

This course is designed to provide instruction in the methods and techniques of installing insulation, interior wall covering materials; stair layout and installation, doors, windows and trim work.

18.0 INSTALL EXTERIOR DOORS--The student will be able to:

18.01 Install exterior door frames and hang doors.
18.02 Identify parts of door frame.
18.03 Install door hardware.

20.0 INSTALL INTERIOR DRY WALL MATERIALS--The student will be able to:

20.01 Install gypsum wallboard.
20.02 Apply laminated gypsum wallboard.

21.0 PERFORM STAIR AND STEP LAYOUT AND CONSTRUCTION--The student will be able to:

21.01 Identify parts of staircase.
21.02 Calculate the number of risers and treads for a stair.
21.03 Lay out, cut and assemble a stair (rough and finish.)

22.0 INSTALL PANELING, FURRING STRIPS, AND CEILINGS--The student will be able to:

22.01 Install paneling.
22.02 Install ceiling materials.
22.03 Install furring strips.

23.0 INSTALL INSULATION AND SOUND CONTROL MATERIALS--The student will be able to:

23.01 Install rigid insulation material.

STUDENT PERFORMANCE STANDARDS	EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial	COURSE CREDIT: 1
PROGRAM TITLE: Residential Carpentry	PROGRAM NUMBER: 8721600
COURSE TITLE: Residential Carpentry 6	COURSE NUMBER: 8721660

COURSE DESCRIPTION:

This course is designed to provide instruction in the manufacture and installation of cabinets and built-ins. Employability skills are also emphasized.

24.0 INSTALL CABINETS AND SHELVING--The student will be able to:

24.01 Identify parts of cabinet or fixture.
24.02 Identify types of cabinet door installations.
24.03 Identify cabinet hardware.
24.04 Install cabinet hardware.
24.05 Install custom-built cabinet.
24.06 Install fixtures.
24.07 Install shelving.

25.0 DEMONSTRATE KNOWLEDGE OF FREE ENTERPRISE SYSTEMS--The student will be able to:

25.01 State the importance of the free enterprise system to the economy.
25.02 State the role of the construction industry within the free enterprise system.

26.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

26.01 Conduct a job search.
26.02 Secure information about a job.
26.03 Identify documents which may be required when applying for a job interview.
26.04 Complete a job application form correctly.
26.05 Demonstrate competence in job interview techniques.
26.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
26.07 Identify acceptable work habits.
26.08 Demonstrate knowledge of how to make job changes appropriately.
26.09 Demonstrate acceptable employee health habits.

27.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

27.01 Define entrepreneurship.
27.02 Describe the importance of entrepreneurship to the American economy.

27.03 List the advantages and disadvantages of business ownership.
27.04 Identify the risks involved in ownership of a business.
27.05 Identify the necessary personal characteristics of a successful entrepreneur.
27.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Residential Electric Wiring

CODE NUMBER: Secondary 8727100 Postsecondary ______

Florida CIP IN46.031200

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVELS(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 10-12, 21

CERTIFICATION COVERAGE: ELECTRICAL 7 TEC CONSTR @ 7 BLDG CONST @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as residential electricians (824.261-010), residential electrician helpers (829.684-022), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the installation, operation, maintenance, and repair of residential electrical systems.

Listed below are the courses that comprise this program when offered at the secondary level:

8727110	Residential Electric Wiring 1
8727120	Residential Electric Wiring 2
8727130	Residential Electric Wiring 3
8727140	Residential Electric Wiring 4
8727150	Residential Electric Wiring 5
8727160	Residential Electric Wiring 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in all phases of residential electric wiring in accordance with existing codes.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After sucessfully completing this program, the student will be able to:

01. Demonstrate proficiency in basic electrical skills.
02. Demonstrate proficiency in DC circuits.
03. Demonstrate proficiency in AC circuits.
04. Demonstrate proficiency in residential wiring skills.
05. Demonstrate proficiency in installation of electric wiring for appliances and special circuits.
06. Demonstrate employability skills.
07. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8727100

PROGRAM TITLE: Residential Electric Wiring POSTSECONDARY NUMBER: ____

01.0 DEMONSTRATE PROFICIENCY IN BASIC ELECTRICAL SKILLS--The student will be able to:

01.01 Demonstrate Proficiency in Laboratory Skills
01.02 Apply laboratory policies and procedures
01.03 Apply laboratory safety rules and procedures
01.04 Demonstrate the operation of laboratory safety devices
01.05 Demonstrate personal safety procedures
01.06 Demonstrate first aid/emergency treatment procedures
01.07 Apply fire safety rules and procedures
01.08 Apply electrical safety rules and procedures
01.09 Demonstrate procedures for disaster situations
01.10 Solve problems requiring addition, subtraction, multiplication and division of whole numbers
01.11 Solve problems requiring addition, subtraction, multiplication and division of common fractions
01.12 Solve problems requiring addition, subtraction, multiplication and division of decimal numbers
01.13 Convert decimals to fractions and fractions to decimals
01.14 Convert English measure to metric measure and metric measure to English measure
01.15 Solder and desolder components
01.16 Drill holes in metal or plastic chassis
01.17 Measure voltage in a simple circuit
01.18 Measure amperage in a simple circuit
01.19 Measure resistance in a simple circuit
01.20 Produce a voltage by chemical means
01.21 Produce a voltage by mechanical means
01.22 Produce a voltage by thermal means
01.23 Produce a voltage by photoelectric means
01.24 Identify physical and mechanical abilities of the electrical trade

02.0 DEMONSTRATE PROFICIENCY IN DC CIRCUITS--The student will be able to:

02.01 Relate electricity to nature of matter
02.02 Identify sources of electricity
02.03 Define voltage, current, resistance, power, and energy
02.04 Apply and relate Ohm's Law
02.05 Measure properties of a circuit using VOM and DVM meters
02.06 Compute and measure conductance and resistance of conductors and insulators
02.07 Troubleshoot series circuits
02.08 Analyze parallel circuits
02.09 Construct parallel circuits
02.10 Troubleshoot parallel circuits
02.11 Define magnetic properties of circuits and devices
02.12 Determine physical and electrical characteristics of capacitors and inductors

03.0 DEMONSTRATE PROFICIENCY IN AC CIRCUITS--The student will be able to:

03.01 Identify AC sources
03.02 Analyze and apply principles of transformers to AC circuits
03.03 Analyze basic motor theory and operation
03.04 Analyze basic generator theory and operation
03.05 Set up and operate a VOM for AC circuits
03.06 Set up and operate a DVM for AC circuits
03.07 Set up and operate power supplies for AC circuits
03.08 Insert capacitors in series in an AC circuit
03.09 Insert inductors in series in an AC circuit
03.10 Analyze power and control transformers
03.11 Construct power and control transformers
03.12 Troubleshoot power and control transformers
03.13 Set up and use watt-hour meters

04.0 DEMONSTRATE PROFICIENCY IN RESIDENTIAL WIRING SKILLS--The student will be able to:

04.01 Obtain electrical wiring installation information from a residential floor plan
04.02 Obtain electrical wiring installation specifications
04.03 Draw a residential electrical floor plan
04.04 Install and wire a single-pole switched lighting circuit
04.05 Install and wire a three-way switched lighting circuit
04.06 Install and wire a combination three-way and four-way switched lighting circuit
04.07 Connect a recessed lighting circuit
04.08 Connect a fluorescent lighting circuit
04.09 Install and wire a duplex receptacle outlet circuit

05.0 DEMONSTRATE PROFICIENCY IN THE INSTALLATION OF ELECTRIC WIRING FOR APPLIANCES AND SPECIAL CIRCUITS--The student will be able to:

05.01 Install and wire a split-circuit duplex receptacle outlet circuit
05.02 Install and wire a special-purpose receptacle outlet circuit
05.03 Wire a space-heating circuit
05.04 Construct a wiring diagram for a heat-pump circuit
05.05 Construct a wiring diagram for a forced-air heating circuit
05.06 Install a service entrance main panel
05.07 Install a service entrance meter base
05.08 Install a low-voltage signal system
05.09 Install a low-voltage remote-control lighting circuit
05.10 Install an emergency alarm system
05.11 Calculate total job installation requirements
05.12 Install an electrical system for a residential swimming pool
05.13 Construct control circuits from schematics associated with drawings
05.14 Install conduit systems for service entrances using G.R.C., I.M.C., E.M.T., and P.V.C. (above- and underground)
05.15 Determine installation requirements for mobile home parks
05.16 Comply with N.E.C. requirements for residential wiring

06.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

06.01 Conduct a job search
06.02 Secure information about a job
06.03 Identify documents that may be required when applying for a job
06.04 Complete a job application form correctly
06.05 Demonstrate competence in job interview techniques
06.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
06.07 Identify acceptable work habits
06.08 Demonstrate knowledge of how to make job changes appropriately
06.09 Demonstrate acceptable employee health habits
06.10 Interact with customers
06.11 Locate local and regional job opportunities

07.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP: The student will be able to:

07.01 Define entrepreneurship
07.02 Describe the importance of entrepreneurship to the American economy
07.03 List the advantages and disadvantages of business ownership
07.04 Identify the risks involved in ownership of a business
07.05 Identify the necessary personal characteristics of a successful entrepreneur
07.06 Identify the business skills needed to operate a small business efficiently and effectively

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Residential Electric Wiring
PROGRAM NUMBER: 8727100
COURSE TITLE: Residential Electric Wiring 1
COURSE NUMBER: 8727110

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for demonstrating proficiency in laboratory skills.

01.0 DEMONSTRATE PROFICIENCY IN BASIC ELECTRICAL SKILLS--The student will be able to:

01.01 Demonstrate Proficiency in Laboratory Skills
01.02 Apply laboratory policies and procedures
01.03 Apply laboratory safety rules and procedures
01.04 Demonstrate the operation of laboratory safety devices
01.05 Demonstrate personal safety procedures
01.06 Demonstrate first aid/emergency treatment procedures
01.07 Apply fire safety rules and procedures
01.08 Apply electrical safety rules and procedures
01.09 Demonstrate procedures for disaster situations
01.10 Solve problems requiring addition, subtraction, multiplication and division of whole numbers
01.11 Solve problems requiring addition, subtraction, multiplication and division of common fractions
01.12 Solve problems requiring addition, subtraction, multiplication and division of decimal numbers
01.13 Convert decimals to fractions and fractions to decimals
01.14 Convert English measure to metric measure and metric measure to English measure
01.15 Solder and desolder components
01.16 Drill holes in metal or plastic chassis
01.17 Measure voltage in a simple circuit
01.18 Measure amperage in a simple circuit
01.19 Measure resistance in a simple circuit
01.20 Produce a voltage by chemical means
01.21 Produce a voltage by mechanical means
01.22 Produce a voltage by thermal means
01.23 Produce a voltage by photoelectric means
01.24 Identify physical and mechanical abilities of the electrical trade

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STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
COURSE CREDIT: 1
PROGRAM TITLE: Residential Electric Wiring
PROGRAM NUMBER: 8727100
COURSE TITLE: Residential Electric Wiring 2
COURSE NUMBER: 8727120

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for demonstrating proficiency in DC circuits.

02.0 DEMONSTRATE PROFICIENCY IN DC CIRCUITS--The student will be able to:

02.01 Relate electricity to nature of matter
02.02 Identify sources of electricity
02.03 Define voltage, current, resistance, power, and energy
02.04 Apply and relate Ohm's Law
02.05 Measure properties of a circuit using VOM and DVM meters
02.06 Compute and measure conductance and resistance of conductors and insulators
02.07 Troubleshoot series circuits
02.08 Analyze parallel circuits

02.09 Construct parallel circuits
02.10 Troubleshoot parallel circuits
02.11 Define magnetic properties of circuits and devices
02.12 Determine physical and electrical characteristics of capacitors and inductors

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STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1987
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Residential Electric Wiring	PROGRAM NUMBER:	8727100
COURSE TITLE:	Residential Electric Wiring 3	COURSE NUMBER:	8727130

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for demonstrating proficiency in AC circuits.

03.0 DEMONSTRATE PROFICIENCY IN AC CIRCUITS--The student will be able to:

03.01 Identify AC sources
03.02 Analyze and apply principles of transformers to AC circuits
03.03 Analyze basic motor theory and operation
03.04 Analyze basic generator theory and operation
03.05 Set up and operate a VOM for AC circuits
03.06 Set up and operate a DVM for AC circuits
03.07 Set up and operate power supplies for AC circuits
03.08 Insert capacitors in series in an AC circuit
03.09 Insert inductors in series in an AC circuit
03.10 Analyze power and control transformers
03.11 Construct power and control transformers
03.12 Troubleshoot power and control transformers
03.13 Set up and use watt-hour meters

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1987
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Residential Electric Wiring	PROGRAM NUMBER:	8727100
COURSE TITLE:	Residential Electric Wiring 4	COURSE NUMBER:	8727140

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for demonstrating proficiency in residential wiring skills dealing with the installation of electrical wiring for outlets, lights, and switches.

04.0 DEMONSTRATE PROFICIENCY IN RESIDENTIAL WIRING SKILLS--The student will be able to:

04.01 Obtain electrical wiring installation information from a residential floor plan
04.02 Obtain electrical wiring installation specifications
04.03 Draw a residential electrical floor plan
04.04 Install and wire a single-pole switched lighting circuit
04.05 Install and wire a three-way switched lighting circuit
04.06 Install and wire a combination three-way and four-way switched lighting circuit
04.07 Connect a recessed lighting circuit
04.08 Connect a fluorescent lighting circuit
04.09 Install and wire a duplex receptacle outlet circuit

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1987
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Residential Electric Wiring	PROGRAM NUMBER:	8727100
COURSE TITLE:	Residential Electric Wiring 5	COURSE NUMBER:	8727150

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for demonstrating proficiency in residential wiring skills dealing with the installation of electric wiring for appliances and special circuits.

05.0 DEMONSTRATE PROFICIENCY IN INSTALLATION TO ELECTRIC WIRING FOR APPLIANCES AND SPECIAL CIRCUITS--The student will be able to:

05.01 Install and wire a split-circuit duplex receptacle outlet circuit
05.02 Install and wire a special-purpose receptacle outlet circuit
05.03 Wire a space-heating circuit
05.04 Construct a wiring diagram for a heat-pump circuit
05.05 Construct a wiring diagram for a forced-air heating circuit
05.06 Install a service entrance main panel
05.07 Install a service entrance meter base
05.08 Install a low-voltage signal system
05.09 Install a low-voltage remote-control lighting circuit
05.10 Install an emergency alarm system
05.11 Calculate total job installation requirements
05.12 Install an electrical system for a residential swimming pool
05.13 Construct control circuits from schematics associated with drawings
05.14 Install conduit systems for service entrances using G.R.C., I.M.C., E.M.T., and P.V.C. (above- and underground)
05.15 Determine installation requirements for mobile home parks
05.16 Comply with N.E.C. requirements for residential wiring

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1987
PROGRAM AREA:	Industrial	COURSE CREDIT:	1
PROGRAM TITLE:	Residential Electric Wiring	PROGRAM NUMBER:	8727100
COURSE TITLE:	Residential Electric Wiring 6	COURSE NUMBER:	8727160

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for demonstrating employability skills and an understanding of entrepreneurship.

06.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

06.01 Conduct a job search
06.02 Secure information about a job
06.03 Identify documents that may be required when applying for a job
06.04 Complete a job application form correctly
06.05 Demonstrate competence in job interview techniques
06.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
06.07 Identify acceptable work habits
06.08 Demonstrate knowledge of how to make job changes appropriately
06.09 Demonstrate acceptable employee health habits
06.10 Interact with customers
06.11 Locate local and regional job opportunities

07.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP: The student will be able to:

07.01 Define entrepreneurship
07.02 Describe the importance of entrepreneurship to the American economy
07.03 List the advantages and disadvantages of business ownership
07.04 Identify the risks involved in ownership of a business
07.05 Identify the necessary personal characteristics of a successful entrepreneur
07.06 Identify the business skills needed to operate a small business efficiently and effectively

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Residential Plumbing

CODE NUMBER: Secondary 8721700 Postsecondary ______

Florida CIP IN46.052300

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVELS(S): ____ 7-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 10-12, 21

CERTIFICATION COVERAGE: TEC CONSTR @ 7 BLDG CONST @ 7 PLUMBIN 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as plumbers (862.381-030), pipefitter helpers (862.684-022), or lawn sprinkler installers (869.684-030).

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, use of tools and equipment, blueprint reading, and the assembly, installation, and repair of pipes, fittings, and fixtures of residential heating, water, and drainage systems according to specifications and plumbing codes.

Listed below are the courses that comprise this program when offered at the secondary level:

8721710	Residential Plumbing 1
8721720	Residential Plumbing 2
8721730	Residential Plumbing 3
8721740	Residential Plumbing 4
8721750	Residential Plumbing 5
8721760	Residential Plumbing 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in planning, layout, and installation of residential plumbing systems including water supply, sewer, drain, waste, and vent systems.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

Students completing this program may develop additional skills by enrolling in a residential and commercial plumbing program in a postsecondary school.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills, and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After sucessfully completing this program, the individual will be able to:

01. Demonstrate proficiency in performing basic plumbing skills.
02. Demonstrate proficiency in joining pipe.
03. Demonstrate proficiency in reading and interpreting blueprints and specifications.
04. Demonstrate proficiency in laying out a job.
05. Demonstrate proficiency in installing first rough (underground).
06. Demonstrate proficiency in installing second rough (first floor and above).
07. Demonstrate proficiency in trimming out plumbing.
08. Demonstrate proficiency in repairing, servicing, and maintaining plumbing systems.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
SECONDARY NUMBER: 8721700
PROGRAM TITLE: Residential Plumbing
POSTSECONDARY NUMBER: _______

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING BASIC PLUMBING SKILLS--The student will be able to:

01.01 Comply with shop policies and procedures
01.02 Explain the basic theory and principles of plumbing
01.03 Identify and use hand tools
01.04 Identify equipment and safety hazards
01.05 Apply safety procedures
01.06 Identify pipe fittings
01.07 Identify pipe joining methods
01.08 Identify plumbing fixtures and appliances
01.09 Read and interpret and comply with manufacturers' schematics and specifications
01.10 Find information in technical literature
01.11 Give reports orally and in writing
01.12 Listen to and comply with oral and written instructions

02.0 DEMONSTRATE PROFICIENCY IN JOINING PIPE--The student will be able to:

02.01 Wipe a clay pipe joint
02.02 Join clay pipe with a pipe coupling
02.03 Join cast-iron pipe to clay sewer pipe
02.04 Join plastic pipe using the adapter-solvent cement method
02.05 Cut concrete pipe
02.06 Bend steel pipe with a heavy-duty bending tool
02.07 Bend steel pipe with a chain vise and torch
02.08 Cut steel pipe with a one-wheel steel pipe cutter
02.09 Cut steel pipe with a four-wheel steel pipe cutter
02.10 Join plastic pipe to steel pipe
02.11 Thread steel pipe with an adjustable diestock
02.12 Thread steel pipe with a nonadjustable diestock
02.13 Thread steel pipe with a power-driven vise stand
02.14 Cut copper tubing or pipe with a hacksaw
02.15 Cut copper tubing or pipe with a tubing cutter
02.16 Bend copper tubing or pipe with a spring bender
02.17 Join copper tubing or pipe to copper tubing or pipe
02.18 Join copper tubing to brass pipe
02.19 Join copper tubing with a compressed connector
02.20 Join copper tubing to steel pipe
02.21 Join copper tubing or pipe to plastic pipe using the sweat method
02.22 Join copper tubing or pipe to plastic pipe
02.23 Join cast-iron soil pipe using lead and oakum
02.24 Cut cast-iron soil pipe with a snap-type chain cutter
02.25 Join cast-iron soil pipe with a hubless or band-clamp coupling
02.26 Join steel pipe to cast-iron pipe with a hubless coupling
02.27 Join plastic pipe to cast-iron pipe with a hubless coupling
02.28 Braze pipe with a gas torch and filler metal
02.29 Weld pipe with an oxyacetylene torch and filler metal
02.30 Join pipe with an electric arc welder and filler metal

03.0 DEMONSTRATE PROFICIENCY IN READING AND INTERPRETING BLUEPRINTS AND SPECIFICATIONS--The student will be able to:

03.01 Apply basic math skills
03.02 Read and interpret an architect's scale
03.03 Read and interpret a 6-foot rule
03.04 Recognize and identify basic plumbing symbols
03.05 Explain the basic theory and principles of isometrics
03.06 Select fixtures

04.0 DEMONSTRATE PROFICIENCY IN LAYING OUT A JOB--The student will be able to:

04.01 Determine a materials list
04.02 Select material specifications

05.0 DEMONSTRATE PROFICIENCY IN INSTALLING FIRST ROUGH (UNDERGROUND) --The student will be able to:

05.01 Lay out a job on site

05.02 Install building drain, waste, and vent systems
05.03 Install distribution systems
05.04 Install water service
05.05 Install building sewer/septic tanks and/or approved sewer systems
05.06 Test the first rough

06.0 DEMONSTRATE PROFICIENCY IN INSTALLING SECOND ROUGH (FIRST FLOOR AND ABOVE)--The student will be able to:

06.01 Lay out a job on site
06.02 Install hangers and supports
06.03 Install building drain, waste and vent systems
06.04 Install water distribution systems
06.05 Test the second rough

07.0 DEMONSTRATE PROFICIENCY IN TRIMMING OUT PLUMBING--The student will be able to:

07.01 Distribute and place fixtures and appliances
07.02 Install and trim out fixtures
07.03 Install closet flanges
07.04 Install speed stops on water pipes
07.05 Trim out a lavatory
07.06 Trim out water closets
07.07 Trim out bath tubs
07.08 Trim out showers
07.09 Trim out kitchen sinks
07.10 Trim out washing machine drains and piping
07.11 Install garbage disposals
07.12 Hook up ice makers
07.13 Install and trim out water heaters
07.14 Install and hook up dishwashers
07.15 Test and inspect the final installation
07.16 Conduct purification tests

08.0 DEMONSTRATE PROFICIENCY IN REPAIRING, SERVICING, AND MAINTAINING PLUMBING SYSTEMS--The student will be able to:

08.01 Establish positive customer relations
08.02 Troubleshoot and diagnose systems
08.03 Isolate problems
08.04 Determine alternative solutions
08.05 Obtain decisions from customers
08.06 Repair sewer mains
08.07 Repair water mains
08.08 Repair water closet seats, ball cocks, flush valves, floats, lift rods, ball stoppers, and trip levers
08.09 Repair leaks in traps
08.10 Repair leaks in faucets
08.11 Install sink strainers
08.12 Install heater elements
08.13 Replace or repair fixture water-supply pipes
08.14 Reseal toilets to flanges
08.15 Test and inspect repaired systems
08.16 Explain the nature of the problem(s), remedial action(s) needed, and advise the customer on preventive maintenance
08.17 Prepare a job ticket
08.18 Price a job and write the invoice
08.19 Collect for services rendered

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents that may be required when applying for a job.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

- 10.01 Define entrepreneurship.
- 10.02 Describe the importance of entrepreneurship to the American economy.
- 10.03 List the advantages and disadvantages of business ownership.
- 10.04 Identify the risks involved in ownership of a business.
- 10.05 Identify the necessary personal characteristics of a successful entrepreneur.
- 10.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Residential Plumbing PROGRAM NUMBER: 8721700

COURSE TITLE: Residential Plumbing 1 COURSE NUMBER: 8721710

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing residential plumbing skills, and demonstrating employability skills.

01.0 DEMONSTRATE PROFICIENCY IN PERFORMING BASIC PLUMBING SKILLS--The student will be able to:

01.01 Comply with shop policies and procedures
01.02 Explain the basic theory and principles of plumbing
01.03 Identify and use hand tools
01.04 Identify equipment and safety hazards
01.05 Apply safety procedures
01.06 Identify pipe fittings
01.07 Identify pipe joining methods
01.08 Identify plumbing fixtures and appliances
01.09 Read and interpret and comply with manufacturers' schematics and specifications
01.10 Find information in technical literature
01.11 Give reports orally and in writing
01.12 Listen to and comply with oral and written instructions

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents that may be required when applying for a job.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Residential Plumbing PROGRAM NUMBER: 8721700

COURSE TITLE: Residential Plumbing 2 COURSE NUMBER: 8721720

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for performing basic procedures for joining pipe.

02.0 DEMONSTRATE PROFICIENCY IN JOINING PIPE--The student will be able to:

02.01 Wipe a clay pipe joint
02.02 Join clay pipe with a pipe coupling
02.03 Join cast-iron pipe to clay sewer pipe
02.04 Join plastic pipe using the adapter-solvent cement method
02.05 Cut concrete pipe
02.06 Bend steel pipe with a heavy-duty bending tool
02.07 Bend steel pipe with a chain vise and torch
02.08 Cut steel pipe with a one-wheel steel pipe cutter
02.09 Cut steel pipe with a four-wheel steel pipe cutter
02.10 Join plastic pipe to steel pipe
02.11 Thread steel pipe with an adjustable diestock
02.12 Thread steel pipe with a nonadjustable diestock
02.13 Thread steel pipe with a power-driven vise stand

02.14 Cut copper tubing or pipe with a hacksaw
02.15 Cut copper tubing or pipe with a tubing cutter
02.16 Bend copper tubing or pipe with a spring bender
02.17 Join copper tubing or pipe to copper tubing or pipe
02.18 Join copper tubing to brass pipe
02.19 Join copper tubing with a compressed connector
02.20 Join copper tubing to steel pipe
02.21 Join copper tubing or pipe to plastic pipe using the sweat method
02.22 Join copper tubing or pipe to plastic pipe
02.23 Join cast-iron soil pipe using lead and oakum
02.24 Cut cast-iron soil pipe with a snap-type chain cutter
02.25 Join cast-iron soil pipe with a hubless or band-clamp coupling
02.26 Join steel pipe to cast-iron pipe with a hubless coupling
02.27 Join plastic pipe to cast-iron pipe with a hubless coupling
02.28 Braze pipe with a gas torch and filler metal
02.29 Weld pipe with an oxyacetylene torch and filler metal
02.30 Join pipe with an electric arc welder and filler metal

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Residential Plumbing — PROGRAM NUMBER: 8721700

COURSE TITLE: Residential Plumbing 3 — COURSE NUMBER: 8721730

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for reading and interpreting blueprints and specifications and laying out a job.

03.0 DEMONSTRATE PROFICIENCY IN READING AND INTERPRETING BLUEPRINTS AND SPECIFICATIONS--The student will be able to:

03.01 Apply basic math skills
03.02 Read and interpret an architect's scale
03.03 Read and interpret a 6-foot rule
03.04 Recognize and identify basic plumbing symbols
03.05 Explain the basic theory and principles of isometrics
03.06 Select fixtures

04.0 DEMONSTRATE PROFICIENCY IN LAYING OUT A JOB--The student will be able to:

04.01 Determine a materials list
04.02 Select material specifications

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Residential Plumbing — PROGRAM NUMBER: 8721700

COURSE TITLE: Residential Plumbing 4 — COURSE NUMBER: 8721740

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for installing a first rough (underground) and a second (first floor and above).

05.0 DEMONSTRATE PROFICIENCY IN INSTALLING FIRST ROUGH (UNDERGROUND) --The student will be able to:

05.01 Lay out a job on site
05.02 Install building drain, waste, and vent systems
05.03 Install distribution systems
05.04 Install water service

05.05 Install building sewer/septic tanks and/or approved sewer systems
05.06 Test the first rough

06.0 DEMONSTRATE PROFICIENCY IN INSTALLING SECOND ROUGH (FIRST FLOOR AND ABOVE)--The student will be able to:

06.01 Lay out a job on site
06.02 Install hangers and supports
06.03 Install building drain, waste and vent systems
06.04 Install water distribution systems
06.05 Test the second rough

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Residential Plumbing
PROGRAM NUMBER: 8721700

COURSE TITLE: Residential Plumbing 5
COURSE NUMBER: 8721750

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for triming out plumbing.

07.0 DEMONSTRATE PROFICIENCY IN TRIMMING OUT PLUMBING--The student will be able to:

07.01 Distribute and place fixtures and appliances
07.02 Install and trim out fixtures
07.03 Install closet flanges
07.04 Install speed stops on water pipes
07.05 Trim out a lavatory
07.06 Trim out water closets
07.07 Trim out bath tubs
07.08 Trim out showers
07.09 Trim out kitchen sinks
07.10 Trim out washing machine drains and piping
07.11 Install garbage disposals
07.12 Hook up ice makers
07.13 Install and trim out water heaters
07.14 Install and hook up dishwashers
07.15 Test and inspect the final installation
07.16 Conduct purification tests

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
COURSE CREDIT: 1

PROGRAM TITLE: Residential Plumbing
PROGRAM NUMBER: 8721700

COURSE TITLE: Residential Plumbing 6
COURSE NUMBER: 8721760

COURSE DESCRIPTION:

This course is designed to provide instruction in the different procedures for repairing, servicing, and maintaining plumbing systems.

08.0 DEMONSTRATE PROFICIENCY IN REPAIRING, SERVICING, AND MAINTAINING PLUMBING SYSTEMS--The student will be able to:

08.01 Establish positive customer relations
08.02 Troubleshoot and diagnose systems
08.03 Isolate problems
08.04 Determine alternative solutions
08.05 Obtain decisions from customers
08.06 Repair sewer mains

08.07 Repair water mains
08.08 Repair water closet seats, ball cocks, flush valves, floats, lift rods, ball stoppers, and trip levers
08.09 Repair leaks in traps
08.10 Repair leaks in faucets
08.11 Install sink strainers
08.12 Install heater elements
08.13 Replace or repair fixture water-supply pipes
08.14 Reseal toilets to flanges
08.15 Test and inspect repaired systems
08.16 Explain the nature of the problem(s), remedial action(s) needed, and advise the customer on preventive maintenance
08.17 Prepare a job ticket
08.18 Price a job and write the invoice
08.19 Collect for services rendered

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK　PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION　EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Roofing

CODE NUMBER: Secondary ______ Postsecondary BCT0115

Florida CIP IN46.041000

SECONDARY SCHOOL CREDITS ______　COLLEGE CREDITS ______　POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational　x　Other 13-17

CERTIFICATION COVERAGE: TEC CONSTR @ 7　ROOFING 7　BLDG CONST @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as roofers (50023600), or to provide supplemental training for persons previously or currently employed in this occupation.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, ladders and scaffolds, waterproofing, and installation of all types of residential and commercial roofing.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in safe use of tools and equipment including ladders and scaffolds, and the installation of shingle, built-up, single ply, and clay tile roofing.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 450 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Read and interpret blueprints and schematics.
02. Demonstrate use and care of hand tools and equipment including ladders and scaffolds.
03. Perform estimates.
04. Identify types of roofing decks.
05. Install shingle roofs.
06. Install build up roofing.
07. Install single ply roofing.
08. Install clay tile roofing.
09. Explain OSHA requirements for working on elevated levels.
10. Demonstrate employability skills.
11. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial
SECONDARY NUMBER: __________
PROGRAM TITLE: Roofing
POSTSECONDARY NUMBER: BCT0115

01.0 READ AND INTERPRET BLUEPRINTS AND SCHEMATICS--The student will be able to:

01.01 Read and interpret the individual scales of the architect scale.
01.02 Read and interpret the individual scales of the engineers scale.
01.03 Identify and interpret architectural drawings.
01.04 Identify and read lines in the alphabet of lines.
01.05 Demonstrate knowledge and proficiency of commonly used symbols and abbreviations.
01.06 Read and interpret basic dimensions of linear, angular and circular types.
01.07 Determine area from given dimensions.
01.08 Demonstrate knowledge and proficiency of tolerance dimensions.
01.09 Convert blueprint dimensions to actual distance.
01.10 Define/identify the various blueprint/schematic terms.

02.0 DEMONSTRATE USE AND CARE OF HAND TOOLS AND EQUIPMENT INCLUDING LADDERS AND SCAFFOLDS--The student will be able to:

02.01 Identify basic hand tools.
02.02 Identify basic rules concerning safe use and care of tools and equipment.
02.03 Select correct tools for the selected skills.
02.04 Demonstrate the safe and correct use of each item of tools and equipment.
02.05 Select and demonstrate proper use of the types of ladders.
02.06 Demonstrate proper procedures in erecting a scaffold.

03.0 PERFORM ESTIMATES--The student will be able to:

03.01 Solve material and cost estimating problems.
03.02 Estimate time and wage costs to complete a specified job.
03.03 Develop cost comparison of performing versus contracting.
03.04 Determine materials and supplies according to blueprints.
03.05 Convert required materials and supplies to appropriate measure--square feet, squares, board feet, etc.
03.06 Prepare an order for materials and supplies.

04.0 IDENTIFY TYPES OF ROOFING DECKS--The student will be able to:

04.01 Identify purposes of a roof.
04.02 Identify roofing members.
04.03 Describe the seven roofing styles.
04.04 Lay out and demonstrate models of roof styles.

05.0 INSTALL SHINGLE ROOFS--The student will be able to:

05.01 Identify and select the most commonly used shingles.
05.02 Demonstrate cutting of roofing paper.
05.03 Demonstrate application of roofing paper.
05.04 Demonstrate use of nails and staples in attaching roof paper.
05.05 Demonstrate attachment of wood shingles.
05.06 Demonstrate use of punch for hole punching wood shingles.
05.07 Demonstrate attachment of fiberglass shingles.
05.08 Demonstrate attachment of asphalt shingles.
05.09 Select, prepare and install flashing materials.
05.10 Select and demonstrate use of fasteners for each shingle type.
05.11 Describe roofing paper and its uses.
05.12 Locate and repair leaks.

06.0 INSTALL BUILD-UP ROOFING--The student will be able to:

06.01 Describe characteristics of "build-up" roofs.
06.02 Identify, select and describe materials for "build-up" roof.
06.03 Demonstrate application of tar or asphalt to roof base.
06.04 Demonstrate step-by-step procedure for installation.
06.05 Select and prepare flashing materials including gravel stop fascia.
06.06 Select and demonstrate use of fasteners.
06.07 Demonstrate construction and attachment of pre-fabricated roof sections.
06.08 Locate and repair leaks.

07.0 INSTALL SINGLE-PLY ROOFING--The student will be able to:

07.01 Describe and apply criteria for single-ply roofs.
07.02 Demonstrate cutting of roofing paper.
07.03 Demonstrate installation of roofing paper.
07.04 Demonstrate use of nails and staples in attaching roofing paper.
07.05 Select and prepare flashing materials for installation.
07.06 Demonstrate installation of roofing materials with appropriate fasteners.
07.07 Describe roofing paper and its uses.
07.08 Locate and repair leaks.

08.0 INSTALL CLAY TILE ROOFING--The student will be able to:

08.01 Describe and apply criteria for using clay tile.
08.02 Demonstrate cutting of roofing paper.
08.03 Demonstrate installation of roofing paper.
08.04 Demonstrate use of nails and staples in attaching roofing paper.
08.05 Select and prepare flashing materials for installation.
08.06 Demonstrate use of punch in preparing holes for attaching tile roofing.
08.07 Locate and repair leaks.

09.0 EXPLAIN OSHA REQUIREMENTS FOR WORKING ON ELEVATED LEVELS--The student will be able to:

09.01 Describe requirements and use of portable and fixed access to upper level worksite.
09.02 Identify kinds of scaffolding procedures and requirements.
09.03 Identify housekeeping and general safety hazards while performing at elevated levels.
09.04 Identify requirements of medical and first aid services.
09.05 Demonstrate basic first aid procedures.
09.06 List and describe uses of personal protection devices and activities.
09.07 Identify and describe the classes of fires.
09.08 Identify and describe the types of fire extinguishers.
09.09 Select and operate a fire extinguisher.
09.10 Demonstrate knowledge of record keeping and other reporting procedures.

10.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

10.01 Conduct a job search.
10.02 Secure information about a job.
10.03 Identify documents which may be required when applying for a job interview.
10.04 Complete a job application form correctly.
10.05 Demonstrate competence in job interview techniques.
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
10.07 Identify acceptable work habits.
10.08 Demonstrate knowledge of how to make job changes appropriately.
10.09 Demonstrate acceptable employee health habits.

11.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

11.01 Define entrepreneurship.
11.02 Describe the importance of entrepreneurship to the American economy.
11.03 List the advantages and disadvantages of business ownership.
11.04 Identify the risks involved in ownership of a business.
11.05 Identify the necessary personal characteristics of a successful entrepreneur.
11.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Safety Engineering Technology

CODE NUMBER: Secondary _______ Postsecondary ETI0720

Florida CIP IN15.060800

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-15

CERTIFICATION COVERAGE: IND ENGR 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as safety inspectors (168.264-014), building inspectors (168.267-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and skills to technically assist in analyzing working conditions and providing technical assistance in the maintenance of materials, equipment, and fire safety systems.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in analyzing work place conditions determining potentially unsafe work place conditions, correcting unsafe conditions and safety engineering techniques.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1620 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Read and interpret blueprints and schematics.
02. Develop drawings or sketches of safety devices or plant layouts.
03. Demonstrate understanding of safety engineering techniques.
04. Analyze workplace environmental elements.
05. Demonstrate understanding of methods for correcting or preventing unsafe conditions.
06. Perform cost analyses of corrective measures.
07. Interpret related legislation.
08. Read, interpret, and write technical reports.
09. Develop safety training programs for hazardous work environments.
10. Demonstrate employability skills.
11. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial SECONDARY NUMBER: __________

PROGRAM TITLE: Safety Engineering Technology POSTSECONDARY NUMBER: ETI0720

01.0 READ AND INTERPRET BLUEPRINTS AND SCHEMATICS--The student will be able to:

01.01 Identify commonly used symbols and lines.
01.02 Read architect's scale and engineer's scale.
01.03 Identify mechanical symbols.
01.04 Read and interpret blueprints and specifications.

02.0 DEVELOP DRAWINGS OR SKETCHES OF SAFETY DEVICES OR PLANT LAYOUTS--The student will be able to:

02.01 Convert actual distance to blueprint/sketch dimensions.
02.02 Develop sketches from data.

03.0 DEMONSTRATE UNDERSTANDING OF SAFETY ENGINEERING TECHNIQUES--The student will be able to:

03.01 Apply sound/noise control concepts to operating equipment.
03.02 Apply equipment guarding techniques to operating equipment.
03.03 Determine dust control measures needed in an operational situation.

04.0 ANALYZE WORK PLACE ENVIRONMENTAL ELEMENTS--The student will be able to:

04.01 Analyze air samples for dust.
04.02 Analyze air samples for toxic fumes.
04.03 Determine minimum exposure times for workers, using a D6 meter.
04.04 Analyze the ergonomics of a work site.

05.0 DEMONSTRATE UNDERSTANDING OF METHODS FOR CORRECTING OR PREVENTING UNSAFE CONDITIONS--The student will be able to:

05.01 Explain the purpose of the American National Standards Institute and similar organizations.
05.02 Using standards tables, compute the minimum acceptable standards for state situations.
05.03 Using State and Federal Code and Regulations, determine acceptable work place standards.
05.04 Set up a preventative maintenance schedule for a facility and equipment.

06.0 PERFORM COST ANALYSIS OF CORRECTIVE MEASURES--The student will be able to:

06.01 Compute cost benefit and cost of alternative corrective measures.
06.02 Compute cost of down time versus cost of maintenance.
06.03 Compute cost of repairs versus cost of replacements, including tax benefits to company.

07.0 INTERPRET RELATED LEGISLATION--The student will be able to:

07.01 Explain how legislative or Congressional action becomes regulation.
07.02 Explain how regulatory agencies determine final regulation.
07.03 Given a specific regulation, explain how to get regulatory agency clarification.
07.04 Determine how equipment and work conditions comply with state regulations.

08.0 READ, INTERPRET AND WRITE TECHNICAL REPORTS--The student will be able to:

08.01 Summarize a technical report.
08.02 Develop bar and line graphs.
08.03 Write a justification for corrective action.

09.0 DEVELOP SAFETY TRAINING PROGRAMS FOR HAZARDOUS WORK ENVIRONMENTS--The student will be able to:

09.01 Perform a job safety analysis.
09.02 Determine the safe and proper methods for doing a job.
09.03 Develop a training plan to insure development of proper work habits in workers trained.
09.04 Develop a refresher training program to review the safe and efficient methods of working in a hazardous area.

10.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

10.01 Conduct a job search.
10.02 Secure information about a job.
10.03 Identify documents which may be required when applying for a job interview.
10.04 Complete a job application form correctly.
10.05 Demonstrate competence in job interview techniques.
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
10.07 Identify acceptable work habits.
10.08 Demonstrate knowledge of how to make job changes appropriately.
10.09 Demonstrate acceptable employee health habits.

11.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

11.01 Define entrepreneurship.
11.02 Describe the importance of entrepreneurship to the American economy.
11.03 List the advantages and disadvantages of business ownership.
11.04 Identify the risks involved in ownership of a business.
11.05 Identify the necessary personal characteristics of a successful entrepreneur.
11.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education — SECONDARY NUMBER: ________

PROGRAM TITLE: School Bus Driver Training — POSTSECONDARY NUMBER: TRA0850

01.0 PERFORM PRE-TRIP INSPECTION OF VEHICLE--The student will be able to:

01.01 Check for and interpret fluid leaks on the ground.
01.02 Check for underinflated, flat, worn, or damaged tires.
01.03 Check for loose or missing lug nuts.
01.04 Check the physical appearance of the bus.
01.05 Check the engine compartment fluid levels.
01.06 Check the condition of the engine compartment drive belts.
01.07 Check the condition of the engine wiring harness.
01.08 Check the condition of the spark plug wires.
01.09 Check the condition of all hoses.
01.10 Properly check the fire extinguisher.
01.11 Check the condition of the first aid kit.
01.12 Check quantity and secure mounting of the reflective triangles.
01.13 Properly adjust the driver's seat and seatbelt.
01.14 Check and adjust all mirrors.
01.15 Check brake system for proper vacuum or air pressure.
01.16 Assure adequate fuel level for the trip.
01.17 Check for adequate oil pressure.
01.18 Check the charging system for proper operation.
01.19 Determine that the engine cooling system is operating normally.
01.20 Check the directional signals.
01.21 Check the pupil warning lights.
01.22 Check the tail lights.
01.23 Check the interior bus lights.
01.24 Check the defrosters.
01.25 Check the heater system.
01.26 Check the service door.
01.27 Check the emergency door.
01.28 Check the clearance and I.D. lights.
01.29 Check the stop lights.
01.30 Check th emergency flashers.
01.31 Check the headlights.
01.32 Check the stop arm and lights.
01.33 Check the operation of the horn.
01.34 Inspect the bus interior for cleanliness.
01.35 Check the exhaust system for leaks.
01.36 Perform an operational test of the brake system.
01.37 Check for unusual or strong odors.
01.38 Check for loose or too stiff steering.

02.0 PERFORM RECORDKEEPING--The student will be able to:

02.01 Keep the route book up to date.
02.02 Prepare an accident report.
02.03 Report any unsafe conditions on the county-developed bus inspection form.
02.04 Note all times and odometer readings on the field trip form.
02.05 Perform any other recordkeeping as required by Transportation Department.

03.0 PLACE VEHICLE IN MOTION--The student will be able to:

03.01 Insert key in ignition.
03.02 Close the doors.
03.03 Adjust the driver's seat.
03.04 Adjust the driver's seat belt.
03.05 Check the mirrors for proper adjustment.
03.06 Set the parking brake.
03.07 Place gear selector in neutral for manual shift; neutral or park for automatic.
03.08 Press clutch (manual shift).
03.09 Turn key to start position and release when the engine starts.
03.10 Place a vehicle with a standard transmission in motion.
03.11 Place a vehicle with an automatic transmission in motion.

04.0 SLOW AND STOP VEHICLE--The student will be able to:

04.01 Check and evaluate traffic conditions.
04.02 Position the vehicle appropriately.

04.03 Release the accelerator.
04.04 Brake to a smooth stop.
04.05 Press clutch just prior to a complete stop (manual shift).
04.06 Shift to an appropriate gear position.
04.07 Set the parking brake.
04.08 Turn off all accessories and ignition.

05.0 OPERATE VEHICLE SAFELY AND EFFICIENTLY IN TRAFFIC, PASSING, AND TURNING--The student will be able to:

05.01 Determine safe following distances under all weather conditions.
05.02 Demonstrate proper procedures for crossing railroad tracks.
05.03 Demonstrate their knowledge of which driver must yield the right-of-way in various situations.
05.04 Demonstrate proper knowledge and understanding of green, yellow, and red traffic signals.
05.05 Explain when passing on the right and on the left is permitted and prohibited.
05.06 Demonstrate their ability to make a right turn.
05.07 Demonstrate the ability to make a left turn.

06.0 EXHIBIT GOOD GENERAL DRIVING ABILITY AND HABITS--The student will be able to:

06.01 Identify the meaning of the standard colors used on traffic signs.
06.02 Identify the meaning of the standard shapes used on traffic signs.
06.03 Identify standard roadway markings.
06.04 Identify and list a set of principles for preventing and correcting any kind of traction loss.
06.05 Explain the correct response for loss of brakes.
06.06 Explain the correct response for steering failure.
06.07 Explain the correct response for tire blow-out.
06.08 Explain the correct response for headlight failure.
06.09 Explain the correct response for accelerator sticking.
06.10 Explain the correct response for engine overheating.
06.11 Identify the three classifications of fires and name the types of fire extinguishers for each.
06.12 Explain emergency evacuation procedures.
06.13 Explain the requirements and correct procedures for staking out a disabled school bus.
06.14 Explain the legal requirements and recommendations on stop locations for loading and unloading passengers.
06.15 Describe the proper and improper use of the alternately flashing red and amber pupil warning lights.
06.16 Correctly sequence the necessary actions for loading passengers on the highway or street.
06.17 Correctly sequence the necessary actions for loading passengers on school or other private property.
06.18 Correctly sequence the necessary actions for loading passengers at a turn-around stop.
06.19 Correctly sequence the necessary actions for unloading passengers on school or other private property.
06.20 Correctly sequence the necessary actions for unloading passengers on the highway or street.
06.21 Correctly sequence the necessary actions for unloading passengers at a turn-around stop.
06.22 Explain the procedure for reporting motorists who illegally pass the bus when loading and unloading passengers.
06.23 Explain the importance of maintaining an accurate time schedule.
06.24 Describe the nature of young people.
06.25 Describe the stages of human development.
06.26 Explain how desires, fears, and drives of young people motivate their behavior.
06.27 Identify common characteristics of people and describe how to deal with these characteristics.
06.28 Identify negative roadblocks to effective communications with students.
06.29 Identify driver actions that affect positive student behavior.
06.30 State the responsibilities of the passenger management team members.
06.31 Explain how to communicate important information to exceptional education children.
06.32 Explain how to handle behavior problems with special education children.

06.33 Explain how to handle health problems with exceptional education children.
06.34 Explain when and how exceptional children should be evacuated from a school bus.
06.35 Explain the proper treatment for handling on-board seizures.
06.36 Explain the use and importance of the medical information card.

07.0 DEMONSTRATE THE ABILITY TO GIVE FIRST AID--The student will be able to:

07.01 Explain and demonstrate the proper procedure for mouth-to-mouth and mouth-to-nose resuscitation.
07.02 Explain and demonstrate the proper procedure for clearing an obstructed airway.
07.03 Explain and demonstrate the proper methods of controlling bleeding.
07.04 Identify the symptoms of shock and explain the proper procedure for treating shock.
07.05 Explain the proper treatment for eye injuries, vomiting, mouth or face injuries, fainting, falls, and epileptic seizures.
07.06 Identify the location and contents of the first aid kit.

08.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

08.01 Conduct a job search.
08.02 Secure information about a job.
08.03 Identify documents which may be required when applying for a job interview.
08.04 Complete a job application form correctly.
08.05 Demonstrate competence in job interview techniques.
08.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
08.07 Identify acceptable work habits.
08.08 Demonstrate knowledge of how to make job changes appropriately.
08.09 Demonstrate acceptable employee health habits.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Sewing Machine Maintenance and Repair

CODE NUMBER: Secondary ______ Postsecondary EER0300

Florida CIP IN47.049902

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-15

CERTIFICATION COVERAGE: SEW MAC RE 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as power sewing machine mechanics (639.281-018), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, maintenance and adjustment of sewing machines, and repair of malfunctioning machines used in the fabric and leather manufacturing industry.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the use of schematics, developing troubleshooting skills and the maintenance, adjustment and repair of commercially oriented sewing machines. Lab activities may also include fabrication of new parts using machine tools.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1200 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of procedures.
02. Maintain, repair and adjust single needle lockstitch mechanisms.
03. Maintain, repair and adjust double needle lockstitch mechanisms.
04. Maintain, repair and adjust zigzag lockstitch mechanisms.
05. Maintain, repair and adjust single needle chainstitch (two threads) mechanisms.
06. Maintain, repair and adjust double needle chainstitch (four threads) mechanisms.
07. Maintain, repair and adjust cover stitch mechanisms - two needles, one looper and three thread.
08. Maintain, repair and adjust button sewing mechanisms - straight needle bar single thread.

09. Maintain, repair and adjust blind stitch mechanisms - single thread types.
10. Maintain, repair and adjust two and three thread over-lock machines.
11. Maintain, repair and adjust double needle tru-safety machines.
12. Maintain, repair and adjust single thread button hole machine.
13. Identify needle problems and solutions.
14. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS

SEWING MACHINE MAINTENANCE AND REPAIR

01.0 DEMONSTRATE KNOWLEDGE OF PROCEDURES — The student will be able to:

01.01 Exercise care of equipment.
01.02 Report defective equipment.
01.03 Use shop safety practices in handling tools and equipment.

02.0 MAINTAIN, REPAIR AND ADJUST SINGLE NEEDLE LOCKSTITCH — The student will be able to:

02.01 Identify timing marks.
02.02 Install the needle bar.
02.03 Dismantle hook.
02.04 Assemble hook.
02.05 Identify various feed-dogs.
02.06 Install feed-dog.
02.07 Set feed-dog.
02.08 Identify proper plate.
02.09 Adjust feed-dog to plate.
02.10 Disassemble bobbin case.
02.11 Set proper tension.
02.12 Identify take-up.
02.13 Remove take-up.
02.14 Install take-up.
02.15 Remove and identify five parts of tension.
02.16 Adjust springs of tension.

03.0 MAINTAIN, REPAIR, AND ADJUST DOUBLE NEEDLE LOCKSTITCH MECHANISMS — The student will be able to:

03.01 Identify timing marks.
03.02 Change clamp.
03.03 Dismantle hooks.
03.04 Assemble hooks.
03.05 Identify hooks.
03.06 Identify parts of feed-dog.
03.07 Install parts of feed-dog.
03.08 Set parts of feed-dog.
03.09 Explain function of gears.
03.10 Indicate rotation of gears.
03.11 Adjust springs of tension.
03.12 Remove and identify five parts of tension.
03.13 List four parts of stitch regulator.
03.14 Set stitch length

04.0 MAINTAIN, REPAIR, AND ADJUST ZIZZAG LOCKSTITCH — The student will be able to:

04.01 Identify needle-bar types (one and two needle).
04.02 Remove and adjust needle-bar.
04.03 Remove hook and replace without putting machine out of time.
04.04 Dismantle and assemble hook.
04.05 Remove and replace hook gears of feed-dog.
04.06 Distinguish proper gears.
04.07 Remove belts.
04.08 Change belts in machine.
04.09 Dismantle complete tensions.
04.10 Replace and check spring in tensions.
04.11 Set stitch regulator.
04.12 Remove stitch regulator from shaft.

05.0 MAINTAIN, REPAIR, AND ADJUST SINGLE NEEDLE — The student will be able to:

05.01 Remove and identify proper looper.
05.02 Recognize a worn looper from a new looper.
05.03 Set and time looper to the needle.
05.04 Remove and check needle-bar for straightness.
05.05 Replace needle-bar and check for alignment.
05.06 Check plate for defects.
05.07 Refinish needle hole in plate.
05.08 Check plate for alignment.
05.09 Set feed-dog to proper height.
05.10 Align feed-dog in feed-fork.

05.11 Level feed-dog in feed-fork.
05.12 Adjust foot to proper pressure for the work.
05.13 Align foot to the needle hole and needle-bar.
05.14 Remove stitch regulator from end of shaft.
05.15 Set proper motion on stitch regulator.
05.16 Align stitch regulator to the feed rocker.
05.17 Remove and assemble tensions.
05.18 Set proper tension release.
05.19 Observe faulty studs.

06.0 MAINTAIN, REPAIR, AND ADJUST DOUBLE NEEDLE CHAIN-STITCH (FOUR THREADS) — The student will be able to:

06.01 Set loopers.
06.02 Set loopers timing.
06.03 Explain loopers and needle motion.
06.04 Explain the avoid motion of looper-carriers.
06.05 Adjust looper-carriers.
06.06 Identify parts of looper-carriers.
06.07 Set height of needle-bar.
06.08 Time needle-bar to loopers.
06.09 Identify plate.
06.10 Install and remove plates.
06.11 Install feed-dog.
06.12 Adjust height of feed-dog.
06.13 Set the height of the presser-bar.
06.14 Set foot pressure.
06.15 Install bottom thread take-up.
06.16 Adjust take-up tensions.
06.17 Change stitch length.
06.18 Explain the locking met on stitch regulator.
06.19 Adjust tension for needle threads.
06.20 Adjust tension for loopers.
06.21 Set needle into needle clamps.
06.22 Remove and install needle clamps.

07.0 MAINTAIN, REPAIR, AND ADJUST COVER STITCH MECHANISMS — TWO NEEDLES, ONE LOOPER AND THREE THREAD — The student will be able to:

07.01 Remove looper and visually examine for proper curves and scratches.
07.02 Shape looper for proper thread hold.
07.03 Reset and time looper to the needle.
07.04 Define proper mathematical terms for needle spacing in needle-bar.
07.05 Insert needle-bar and clamp proper according to the gauge used.
07.06 Attach plate to proper needle spacing.
07.07 Polish needle plate so that thread can chain off freely.
07.08 Match plate to feed-dog.
07.09 Match the proper feed-dog to existing plate and needle gauge.
07.10 Insert feed-dog into feed fork and level feed-dog into the plate.
07.11 Identify the proper gauge foot for the needle-bar, needle.
07.12 Remove and adjust foot presser on feed-dog and plate.
07.13 Remove and adjust take-up cover for bottom shaft take-up.
07.14 Disassemble and assemble take-up cover plate.
07.15 Insert take-up and proper angle.
07.16 Remove stitch regulator and adjusting screw.
07.17 Adjust regulator for proper length of stitch.
07.18 Remove eccentrics on main shaft.
07.19 Insert eccentrics on proper spot on main shift.
07.20 Remove and replace needle clamps.
07.21 Define the proper size of needle space in needle clamp.

08.0 MAINTAIN, REPAIR, AND ADJUST BUTTON SEWING MECHANISMS — STRAIGHT NEEDLE-BAR SINGLE THREAD — The student will be able to:

08.01 Remove and replace needle-bar.
08.02 Adjust needle-bar to needle length.
08.03 Explain timing marks.
08.04 Adjust needle-bar lever.
08.05 Remove and replace needle-bar lever.
08.06 Adjust neelde-bar to lever.
08.07 Explain constant drag tension.

08.08 Adjust tensions.
08.09 Check position of tensions releasing lever.
08.10 Explain automatic thread tensions.
08.11 Set finger.
08.12 Adjust button clamp shifting roller.
08.13 Adjust eccentric cam.
08.14 Install and time looper to needle.
08.15 Set thread guide.
08.16 Set height of buttom clamp.
08.17 Adjust buttons to clamps.
08.18 Adjust nipper to cut thread.
08.19 Explain function of nipper.

09.0 MAINTAIN, REPAIR, AND ADJUST BLIND STITCH MECHANISMS—SINGLE THREAD TYPES — The student will be able to:

09.01 Install presser-a-foot.
09.02 Adjust presser-a-foot.
09.03 Explain assembly parts.
09.04 Adjust shoe to rib.
09.05 Identify spring adjustment.
09.06 Install needle into needle holder.
09.07 Time frame and needle to rib.
09.08 Adjust looper in holder.
09.09 Remove looper holder.
09.10 Explain eccentrics.
09.11 Adjust eccentrics for proper looper adjustment.
09.12 Remove and replace feed-dog.
09.13 Set proper height on feed-dog.
09.14 Check clearance between feed-dog and looper.
09.15 Set stitch adjusting ring.

10.0 MAINTAIN, REPAIR, AND ADJUST TWO AND THREE NEEDLE OVER-LOCK MACHINES — The student will be able to:

10.01 Identify loopers.
10.02 Set height of loopers.
10.03 Set timing of blind looper.
10.04 Set height of blind looper.
10.05 Set height of primary looper to needle scarf.
10.06 Set 1.5mm to needle.
10.07 Set secondary looper to primary.
10.08 Set height to needle.
10.09 Locate locking screw on eccentric.
10.10 Set stitch length.
10.11 Install plates.
10.12 Identify plates (different types).
10.13 Identify five parts of presser-a-foot.
10.14 Set height of (springs) of presser-a-foot.
10.15 Adjust tensions (springs) of presser-a-foot.
10.16 Install feed-dog.
10.17 Identify three parts of feed-dog.
10.18 Understand differential.
10.19 Set height of feed-dog to plate.
10.20 Adjust needle thread tension.
10.21 Adjust primary looper thread.
10.22 Adjust secondary looper thread.
10.23 Identify five parts of tension assembly.
10.24 Remove and clean screens.
10.25 Drain oil.
10.26 Explain lubrication system.
10.27 Sharpen upper and lower knives.
10.28 Take lower block disassemble
10.29 Take upper block disassemble
10.30 Set upper and lower knives.
10.31 Identify at least five parts on knife assembly.
10.32 Remove needle-bar.
10.33 Set height at 9.5mm.

11.0 MAINTAIN, REPAIR, AND ADJUST DOUBLE NEEDLE TRU-SAFETY MACHINES — The student will be able to:

11.01 Identify loopers.
11.02 Set height of looper.
11.03 Set timing of blind looper.
11.04 Set height of looper.
11.05 Set height of primary looper to needle scarf.
11.06 Set 1.5mm to needle.
11.07 Set height of secondary looper to primary.
11.08 Set height to needle.
11.09 Locate locking screw on an eccentric.
11.10 Set stitch length.
11.11 Locate locking screw on an eccentric.
11.12 Set stitch length.
11.13 Install plates.
11.14 Identify plates (different types).
11.15 Identify five parts of presser-a-foot.
11.16 Set pressure.
11.17 Adjust tension (springs).
11.18 Install feed-dog.
11.19 Identify three parts of feed-dog.
11.20 Understand differential.
11.21 Set height of feed-dog to plate.
11.22 Adjust needle thread tension.
11.23 Adjust primary looper thread.
11.24 Adjust secondary looper thread.
11.25 Identify five parts of tension assembly.
11.26 Remove and clean screen.
11.27 Drain oil.
11.28 Sharpen upper and lower knives.
11.29 Take lower block apart.
11.30 Take upper block apart.
11.31 Set upper and lower knives.
11.32 Identify at least five parts on knife assembly.
11.33 Remove needle-bar.
11.34 Set height at 9.5mm.
11.35 Set looper 1.5mm to needle.
11.36 Set proper angle to needle.
11.37 Set height.

12.0 MAINTAIN, REPAIR, AND ADJUST SINGLE THREAD BUTTON HOLE MACHINE — The student will be able to:

12.01 Utilize gauge to set needle-bar height.
12.02 Set needle-bar vibrate cam.
12.03 Install needle in bar.
12.04 Adjust brake adjustment on feed reversing cam.
12.05 Discuss shifting level friction adjustment.
12.06 Explain feed mechanism adjustment springs.
12.07 Disassemble feed unit.
12.08 Install knife.
12.09 Centralize knife in cutting slot.
12.10 Set position on unclamping handle.
12.11 Adjust height of clamp arm.
12.12 Adjust tripping action.
12.13 Adjust for clearance between stop blot and drive pulley.
12.14 Adjust trip lever.
12.15 Time stop blod side shifting motion.
12.16 Centralize blot idle and drive pulley.
12.17 Install belt.
12.18 Adjust belt shifter.
12.19 Install loopers.
12.20 Use T-50 gauge to set looper.
12.21 Adjust looper timing cam.
12.22 Use a six inch scale to obtain proper height on needle-bar.
12.23 Relate looper and needle-bar setting.
12.24 Understand thread trimming functions.
12.25 Replace trimming knife.
12.26 Position thread hook and thread hook actuator collar.
12.27 Adjust safety arm adjustment.

13.0 IDENTIFY NEEDLE PROBLEMS AND SOLUTION — The student will be able to:

13.01 Explain stitching.
13.02 Explain needle thread breakage or fraying.
13.03 Explain needle heat problem.
13.04 Explain needle breakage.
13.05 Identify basic needle dimensions.
13.06 Name at least five points of needles.
13.07 Explain butt to eye.
13.08 Explain spot or scarf type.
13.09 Determine overall length.
13.10 Explain groove types such as single, double, spiral, twist.
13.11 Explain thread loop on needle rise.
13.12 Explain take-up.
13.13 Explain looper movement to needle thread loop.

14.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS — The student will be able to:

14.01 List sources of job opening other than public or private employment agencies.
14.02 Write a letter of application for a job.
14.03 Prepare a vita, resume or personal fact sheet.
14.04 List factors to consider when applying for a job.
14.05 List ways of making contact with employers.
14.06 Identify documents which may be required when applying for a job interview.
14.07 Complete a job application form correctly.
14.08 Identify appropriate dress and grooming for a job interview.
14.09 Classify behaviors considered appropriate or inappropriate in a job interview situation.
14.10 Describe advantage to employerr and employees of being a productive worker.
14.11 Explain the purpose of supervision, self discipline and performance evaluation.
14.12 Identify appropriate response(s) to criticism from employer, supervisor or other employees.
14.13 List consequences of being absent frequently from the job.
14.14 List consequences of frequently arriving late for work.
14.15 List factors to consider when resigning from a job.
14.16 Write a letter of resignation.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Sheet Metal Work

CODE NUMBER: Secondary ______ Postsecondary MTR0360

Florida CIP IN48.050600

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-17

CERTIFICATION COVERAGE: SHEETMETAL 7 METAL WORK @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as sheet metal pattern cutters (730.684-074), sheet metal workers (804.281-010), skin fitters (806.381-054), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the layout, fabrication, erection, or installation and maintenance of items made of sheet steel, copper, stainless steel and aluminum using handtools and machines.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in layout, cutting, forming, fabricating and installing mechanical, architectural and specialty metal products.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate understanding of procedures and trade safety practices.
02. Read blueprints.
03. Lay out sheet metal.
04. Fabricate mechanical systems.
05. Fabricate architectural/roofing sheet metal.
06. Fabricate specialty sheet metal.
07. Fabricate food and beverage dispensing equipment.
08. Weld sheet metal.
09. Install mechanical systems.
10. Install architectural/roofing sheet metal.
11. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS

SHEET METAL WORK

01.0 DEMONSTRATE UNDERSTANDING OF PROCEDURES AND TRADE SAFETY PRACTICES — The student will be able to:

01.01 Apply safety rules and procedures.
01.02 Explain school/class procedures.
01.03 Demonrate use and care of tools.

02.0 READ BLUEPRINTS — The student will be able to:

02.01 Interpret detail drawings.
02.02 Read symbols.
02.03 List materials for fabrication from blueprints.
03.04 Develop shop drawings.

03.0 LAYOUT SHEET METAL — The student will be able to:

03.01 Lay out rectangular straight duct.
03.02 Lay out rectangular squae throat and square heel duct elbow.
03.03 Lay out rectangular duct ogee offset.
03.04 Lay out rectangular taper duct (centerline taper).
03.05 Lay out rectangular duct Y branch.
03.06 Lay out round straight duct.
03.07 Lay out round duct elbow.
03.08 Lay out round duct Y branch.
03.09 Lay out round duct offset.
03.10 Lay out round duct taper (transitional).
03.11 Lay out round duct lateral (round tap).
03.12 Lay out batten seam metal roof panel and cap.
03.13 Lay out square happer.
03.14 Lay out belt guard.

04.0 FABRICATE MECHANICAL SYSTEMS — The student will be able to:

04.01 Fabricate rectangular radius throat and radius heel duct elbow.
04.02 Fabricate rectangular square throat and square heel duct elbow
04.03 Fabricate rectangular duct ogee offset.
04.04 Fabricate rectangular duct transition.
04.05 Fabricate rectangular duct Y branch.
04.06 Fabricate rectangular shoe tap.
04.07 Fabricate round straight duct.
04.08 Fabricate round duct elbow.
04.09 Fabricate round duct Y branch.
04.10 Fabricate round duct offset
04.11 Fabricate round duct taper (transitional).
04.12 Fabricate round duct lateral (round tap).
04.13 Fabricate round saddle tap.
04.14 Fabricate single wall equipment casing/housing.
04.15 Fabricate flat S.
04.16 Fabricate bar S.
04.17 Fabricate drive cleat.
04.18 Fabricate pocket goverment look.
04.19 Fabricate companion angle.
04.20 Fabricate flanged duct ection.

05.0 FABRICATE ARCHTECTURAL/ROOFING SHEET METAL — The student will be able to:

05.01 Fabricate batten seam metal roof panel and ap.
05.02 Fabricate standing seam metal roof panel.
05.03 Fabricate metal flat-look roof panel.
05.04 Fabricate ogee gutter.
05.05 Fabricate half-round gutter.
05.06 Fabricate rectangular downspout/conductor.
05.07 Fabricate offset in rectangular dowspout/conductor
05.08 Fabricate conductor head.
05.09 Fabricate flashing.
05.10 Fabricate roof coping.
05.11 Fabricate gravel top fascia.
05.12 Fabricate metal siding panel.
05.13 Fabricate louver.

05.14 Fabricate metal ceiling panel.

06.0 FABRICATE SPECIALITY SHEET METAL — The student will be able to:

06.01 Fabricate recangular single blade damper in frame.
06.02 Fabricate rectangular tube.
06.03 Fabricate round tube.
06.04 Fabricate hollow metal letter.
06.05 Fabricate round duct support saddle (floor mounted).
06.06 Fabricate belt guard.
06.07 Fabricate blind/drapery pocket (cornice)

07.0 FABRICATE FOOD AND BEVERAGE DISPENSING EQUIPMENT — The student will be able to:

07.01 Fabricate counter top.
07.02 Fabricate shelf.
07.03 Fabricate cabinet shell.
07.04 Fabricate cabinet sliding door.

08.0 WELD SHEET METAL — The student will be able to:

08.01 Weld aluminum with gas tungsten are welding (GTAW) equipment.
08.02 Weld aluminum with gas metal arc welding (GMAW) equipment.
08.03 Weld stainless stell with gas metal arc welding (GMAW) equipment.
08.04 Weld stainless steel with shielded metal arc welding (SMAW) equipment.
08.05 Weld stainless steel with gas tunten arc welding (GTAW) equipment.
08.06 Weld galvanized steel with carbon arc welding (CAW) wquipment.
08.07 Braze galvanized steel.
08.08 Grind and polish metal.
08.09 Solder galvanized steel/copper/stainless steel.

09.0 INSTALL MECHANICAL SYSTEMS — The student will be able to:

09.01 Install rectangular duct system.
09.02 Install round duct system.
09.03 Install single well equipment casing/housng.

10.0 INSTALL ARCHITECTURAL/ROOFING SHEET METAL — The student will be able to:

10.01 Install batten seam metal roof panel and cap.
10.02 Install standing seam metal roof panel.
10.03 Install metal flat-lock roof panel.
10.04 Install ogee qutter.
10.05 Install half-round qutter.
10.06 Install rectangular downspout/conductor.
10.07 Install offset in rectangular downspout/conductor.
10.08 Install conductor head.
10.09 Install flashing
10.10 Install coping
10.11 Install gravel stop fascia.
10.12 Install metal siding.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS — The student will be able to:

11.01 List sources of jobopenings other than public or private employment agencies.
11.02 Write a letter of application for a job.
11.03 Prepare a vita, resume or personal fact sheet.
11.04 List factors to consider when applying for a job.
11.05 List ways of making contact with employers.
11.06 Identify documents which may be required when applying for a job interview
11.07 Complete a job application form currectly.
11.08 Identify appropriate dress and groming for a job interview
11.09 Classify behaviors considered appropriate or inappropriate in a job interview situation.
11.10 Describe advantage to employee and employee of being a productive worker.
11.11 EXplain the purpse of supervision, self disciline and performance evaluation.
11.12 Identify appropriate response(s) to criticism from employer, supervisor or other employees.
11.13 List consequences of being absent frequently from the job.
11.14 List consequences of frequently arriving late for work.
11.15 List factors to consider when resigning from a job.
11.16 Write a letter of resignation.

CURRICULUM FRAMEWORK	PROGRAM AREA: Industrial
FLORIDA DEPARTMENT OF EDUCATION	EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Shoe Repair & Leatherwork

CODE NUMBER: Secondary 8748000 Postsecondary UPH0160

Florida CIP IN47.040600

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVELS(S): ___ 7-9 ___ 9-12 ___ Postsecondary Adult Vocational

___ Postsecondary Vocational X Other 10-12, 21, 13-17

CERTIFICATION COVERAGE: SHOE REPAIR 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment with such titles as shoe repairers (365.361-014), shoe repair helper (365.674-010), repairer (753.684-026), leather worker (783.684-026), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, use and care of hand tools and machines, selection, application and care of materials, interpretation of repair orders and instructions, and repairing and modifying shoes, boots, and other leather items using hand and power tools and machines.

Listed below are the courses that comprise this program when offered at the secondary level:

8748010	Shoe Repair & Leatherwork 1
8748020	Shoe Repair & Leatherwork 2
8748030	Shoe Repair & Leatherwork 3
8748040	Shoe Repair & Leatherwork 4
8748050	Shoe Repair & Leatherwork 5
8748060	Shoe Repair & Leatherwork 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and include instruction in actual repair operations using the tools, materials, and machines commonly found in industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

When the cooperative education method of instruction is used, the program length for the secondary program may be increased by a maximum of 2.0 credits.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this prostsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 contact hours (2160 clock hours).

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After sucessfully completing this program, the individual will be able to:

01. Demonstrate an understanding of the types and care of shoes and boots.
02. Explain shoe and boot construction.
03. Select, use and perform user maintenance on hand tools and power driven machines.
04. Demonstrate proficiency in safety and first aid.
05. Repair shoes and boots including parts replacement and sewing.
06. Make orthopedic alterations to specification.
07. Dye and refinish leather.
08. Repair other leather articles such as handbags, belts, and luggage.
09. Demonstrate salesmanship and simple bookkeeping skills.
10. Demonstrate knowledge of the free enterprise system.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8748000
PROGRAM TITLE: Shoe Repair & Leatherwork POSTSECONDARY NUMBER: UPH0160

01.0 DEMONSTRATE AN UNDERSTANDING OF THE TYPES AND CARE OF SHOES AND BOOTS: The student will be able to:

01.01 Identify and describe various types of shoes
01.02 Identify various kinds of boots
01.03 Describe procedures for care and maintenance for shoes
01.04 Describe procedures for care and maintenance for boots
01.05 Describe procedures for care and maintenance of other leather articles

02.0 EXPLAIN SHOE AND BOOT CONSTRUCTION: The student will be able to:

02.01 List sources of upper materials
02.02 Identify and describe upper materials
02.03 List the types of bottom leathers
02.04 Describe the types of bottom leather
02.05 Describe the kinds of bottom leather
02.06 Describe the grades of bottom leather
02.07 Describe the cuts of bottom leather
02.08 Describe the weights of bottom leather
02.09 Identify and describe weithts of rubber soles
02.10 Identify and describe grades of rubber soles
02.11 Identify and describe sizes of rubber soles
02.12 Identify and describe weights of composition soles
02.13 Identify and describe grades of composition soles
02.14 Identify and describe sizes of composition soles
02.15 Describe the types and kinds of rubber heels
02.16 List weights and colors of composition lifts
02.17 List weights and colors of rubber lifts
02.18 Identify and describe the kinds and uses of nails and thread

03.0 SELECT, USE AND PERFORM USER MAINTENANCE ON HAND TOOLS AND POWER DRIVEN MACHINES: The student will be able to:

03.01 Identify hand tools
03.02 Select appropriate tool for the job skills
03.03 Demonstrate safe, proper use and care of hand tools
03.04 Identity power tools
03.05 Select appropriate power tool for the job skill
03.06 Demonstrate safe, proper use and care of power tools
03.07 Identify special tools
03.08 Determine causes of machine malfunction using trouble shooting skills
03.09 Perform preventative maintenance inspections

04.0 DEMONSTRATE PROFICIENCY IN SAFETY AND FIRST AID: The student will be able to:

04.01 Demonstrate ability to work safely by applying personal safety rules
04.02 Demonstrate ability to keep a clean, orderly and safe work area
04.03 Operate a fire extinguisher
04.04 Apply basic first aid procedures
04.05 Demonstrate safe use of hand and power tools
04.06 Recognize and identiy common safety hazards
04.07 Apply shop policies, shop safety rules and procedures
04.08 Demonstrate knowledge of proper storage of liquid materials
04.09 Perform shop housekeeping duties

05.0 REPAIR SHOES AND BOOTS INCLUDING PARTS REPLACEMENT AND SEWING: The student will be able to:

05.01 Identify the types of seams in hand and machine patching
05.02 Identify the kinds of stitches associated with each seam in hand and machine patching.
05.03 Identify and select appropriate needle size
05.04 Identify and select appropriate thread size
05.05 Demonstrate and perform use of joint seams by hand
05.06 Demonstrate and perform use of overlap or facing seam by hand

05.07 Demonstrate and perform use of facing seam by machine
05.08 Demonstrate and perform use of lap seam by machine
05.09 List and identiy the types and kinds of heels
05.10 Remove old heels, prepare and attach new heels to different types of shoes
05.11 Demonstrate removal of half soles on each type
05.12 Demonstrate procedure for attaching or replacing half sole on each type
05.13 Demonstrate removal of full soles on each type
05.14 Perform replacement procedures of full soles on each type

06.0 MAKE ORTHOPEDIC ALTERATIONS TO SPECIFICATION: The student will be able to:

06.01 Identify the different specialized types of orthopedic devices
06.02 Demonstrate knowledge of repair and alteration of specialized orthopedic devices to specification

07.0 DYE AND REFINISH LEATHER: The student will be able to:

07.01 Explain difference in shining and cleaning of smooth or grain leather
07.02 List the steps, and demonstrate shining of smooth or grain leather
07.03 List the steps and demonstrate the cleaning of smooth or grain leather
07.04 List the steps and demonstrate the cleaning of fabric shoes
07.05 List the steps and demonstrate the cleaning of suede
07.06 List the steps and demonstrate the cleaning of reptile leather
07.07 Explain the difference in dyeing and reinishing smooth or grain leather
07.08 List the steps and demonstrate dyeing of smooth or grain leather
07.09 List the steps in dyeing fabric shoes
07.10 Demonstrate the steps and demonstrate dyeing of suede

08.0 REPAIR OTHER LEATHER ARTICLES SUCH AS HANDBAGS, BELTS, AND LUGGAGE: The student will be able to:

08.01 Identify special tools
08.02 Explain fundamental processes of fabrication and tooling of other leather goods
08.03 List and describe procedures for fabrication and repair of special items such as belts, luggage, and handbags
08.04 Solve material and cost estimating problems
08.05 Apply cleaning and dyeing procedures
08.06 Demonstrate procedures of fabrication and tooling

09.0 DEMONSTRATE SALESMANSHIP AND SIMPLE BOOKKEEPING SKILLS: The student will be able to:

09.01 Comply with local rules, laws and regulations
09.02 Develop an operating budget and accounting practices
09.03 Select site and prepare an advertising plan
09.04 Estimate cost and completion time
09.05 Complete work order and identification systems
09.06 Prepare and take inventory of parts and supplies
09.07 Supervise the work of others
09.08 Identify and select items for resale
09.09 Develop and implement a business schedule
09.10 Organize a display

10.0 DEMONSTRATE KNOWLEDGE OF THE FREE ENTERPRISE SYSTEM: The student will be able to:

10.01 State the importance of the free enterprise system to the economy
10.02 State the role of the shoe repair and leatherwork industry within the free enterprise system

11.0 DEMONSTRATE EMPLOYABILITY SKILLS: The student will be able to:

11.01 Conduct a job search
11.02 Secure information about a job
11.03 Identify documents that may be required when applying for a job
11.04 Complete a job application form correctly

11.05 Demonstrate competence in job interview techniques
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
11.07 Identify acceptable work habits
11.08 Demonstrate knowledge of how to make job changes appropriately
11.09 Demonstrate acceptable employee health habits

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP: The student will be able to:

12.01 Define entrepreneurship
12.02 Describe the importance of entrepreneurship to the American economy
12.03 List the advantages and disadvantages of business ownership
12.04 Identify the risks involved in ownership of a business
12.05 Identify the necessary personal characteristics of a successful entrepreneur
12.06 Identify the business skills needed to operate a small business efficiently and effectively

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial COURSE CREDIT: 1
PROGRAM TITLE: Shoe Repair & Leatherwork PROGRAM NUMBER: 874800
COURSE TITLE: Shoe Repair & Leatherwork 1 COURSE NUMBER: 8748010

COURSE DESCRIPTION:

This course is designed to provide instruction in the understanding of the types and care of shoes and boots, and in shoe and boot construction.

01.0 DEMONSTRATE AN UNDERSTANDING OF THE TYPES AND CARE OF SHOES AND BOOTS: The student will be able to:

01.01 Identify and describe various types of shoes
01.02 Identify various kinds of boots
01.03 Describe procedures for care and maintenance for shoes
01.04 Describe procedures for care and maintenance for boots
01.05 Describe procedures for care and maintenance of other leather articles

02.0 EXPLAIN SHOE AND BOOT CONSTRUCTION: The student will be able to:

02.01 List sources of upper materials
02.02 Identify and describe upper materials
02.03 List the types of bottom leathers
02.04 Describe the types of bottom leather
02.05 Describe the kinds of bottom leather
02.06 Describe the grades of bottom leather
02.07 Describe the cuts of bottom leather
02.08 Describe the weights of bottom leather
02.09 Identify and describe weithts of rubber soles
02.10 Identify and describe grades of rubber soles
02.11 Identify and describe sizes of rubber soles
02.12 Identify and describe weights of composition soles
02.13 Identify and describe grades of composition soles
02.14 Identify and describe sizes of composition soles
02.15 Describe the types and kinds of rubber heels
02.16 List weights and colors of composition lifts
02.17 List weights and colors of rubber lifts
02.18 Identify and describe the kinds and uses of nails and thread

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STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial COURSE CREDIT: 1
PROGRAM TITLE: Shoe Repair & Leatherwork PROGRAM NUMBER: 874800
COURSE TITLE: Shoe Repair & Leatherwork 2 COURSE NUMBER: 8748020

COURSE DESCRIPTION:

This course is designed to provide instruction selecting, using, and performing maintenance on hand tools and power driven machines, and in demonstrating proficiency in safety and first aid.

03.0 SELECT, USE AND PERFORM USER MAINTENANCE ON HAND TOOLS AND POWER DRIVEN MACHINES: The student will be able to:

03.01 Identify hand tools
03.02 Select appropriate tool for the job skills
03.03 Demonstrate safe, proper use and care of hand tools
03.04 Identity power tools
03.05 Select appropriate power tool for the job skill
03.06 Demonstrate safe, proper use and care of power tools
03.07 Identify special tools

03.08 Determine causes of machine malfunction using trouble shooting skills
03.09 Perform preventative maintenance inspections

04.0 DEMONSTRATE PROFICIENCY IN SAFETY AND FIRST AID: The student will be able to:

04.01 Demonstrate ability to work safely by applying personal safety rules
04.02 Demonstrate ability to keep a clean, orderly and safe work area
04.03 Operate a fire extinguisher
04.04 Apply basic first aid procedures
04.05 Demonstrate safe use of hand and power tools
04.06 Recognize and identiy common safety hazards
04.07 Apply shop policies, shop safety rules and procedures
04.08 Demonstrate knowledge of proper storage of liquid materials
04.09 Perform shop housekeeping duties

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Shoe Repair & Leatherwork PROGRAM NUMBER: 8748000

COURSE TITLE: Shoe Repair & Leatherwork 3 COURSE NUMBER: 8748030

COURSE DESCRIPTION:

This course is designed to provide instruction in repairing shoes and boots and includes parts replacement and sewing

05.0 REPAIR SHOES AND BOOTS INCLUDING PARTS REPLACEMENT AND SEWING: The student will be able to:

05.01 Identify the types of seams in hand and machine patching
05.02 Identify the kinds of stitches associated with each seam in hand and machine patching.
05.03 Identify and select appropriate needle size
05.04 Identify and select appropriate thread size
05.05 Demonstrate and perform use of joint seams by hand
05.06 Demonstrate and perform use of overlap or facing seam by hand
05.07 Demonstrate and perform use of facing seam by machine
05.08 Demonstrate and perform use of lap seam by machine
05.09 List and identiy the types and kinds of heels
05.10 Remove old heels, prepare and attach new heels to different types of shoes
05.11 Demonstrate removal of half soles on each type
05.12 Demonstrate procedure for attaching or replacing half sole on each type
05.13 Demonstrate removal of full soles on each type
05.14 Perform replacement procedures of full soles on each type

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STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial COURSE CREDIT: 1

PROGRAM TITLE: Shoe Repair & Leatherwork PROGRAM NUMBER: 8748000

COURSE TITLE: Shoe Repair & Leatherwork 4 COURSE NUMBER: 8748040

COURSE DESCRIPTION:

This course is designed to provide instruction in making orthopedic alterations to specification, and in the proper methods used to dye and refinish leather.

06.0 MAKE ORTHOPEDIC ALTERATIONS TO SPECIFICATION: The student will be able to:

06.01 Identify the different specialized types of orthopedic devices
06.02 Demonstrate knowledge of repair and alteration of specialized orthopedic devices to specification

07.0 DYE AND REFINISH LEATHER: The student will be able to:

07.01 Explain difference in shining and cleaning of smooth or grain leather
07.02 List the steps, and demonstrate shining of smooth or grain leather
07.03 List the steps and demonstrate the cleaning of smooth or grain leather
07.04 List the steps and demonstrate the cleaning of fabric shoes
07.05 List the steps and demonstrate the cleaning of suede
07.06 List the steps and demonstrate the cleaning of reptile leather
07.07 Explain the difference in dyeing and reinishing smooth or grain leather
07.08 List the steps and demonstrate dyeing of smooth or grain leather
07.09 List the steps in dyeing fabric shoes
07.10 Demonstrate the steps and demonstrate dyeing of suede

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial — COURSE CREDIT: 1

PROGRAM TITLE: Shoe Repair & Leatherwork — PROGRAM NUMBER: 8748000

COURSE TITLE: Shoe Repair & Leatherwork 5 — COURSE NUMBER: 8748050

COURSE DESCRIPTION:

This course is designed to provide instruction in the repairing leather articles such as handbags, belts, and luggage, and in developing salesmanship and simple bookkeeping skills.

08.0 REPAIR OTHER LEATHER ARTICLES SUCH AS HANDBAGS, BELTS, AND LUGGAGE: The student will be able to:

08.01 Identify special tools
08.02 Explain fundamental processes of fabrication and tooling of other leather goods
08.03 List and describe procedures for fabrication and repair of special items such as belts, luggage, and handbags
08.04 Solve material and cost estimating problems
08.05 Apply cleaning and dyeing procedures
08.06 Demonstrate procedures of fabrication and tooling

09.0 DEMONSTRATE SALESMANSHIP AND SIMPLE BOOKKEEPING SKILLS: The student will be able to:

09.01 Comply with local rules, laws and regulations
09.02 Develop an operating budget and accounting practices
09.03 Select site and prepare an advertising plan
09.04 Estimate cost and completion time
09.05 Complete work order and identification systems
09.06 Prepare and take inventory of parts and supplies
09.07 Supervise the work of others
09.08 Identify and select items for resale
09.09 Develop and implement a business schedule
09.10 Organize a display

STUDENT PERFORMANCE STANDARDS | EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial | COURSE CREDIT: 1

PROGRAM TITLE: Shoe Repair & Leatherwork | PROGRAM NUMBER: 8748000

COURSE TITLE: Shoe Repair & Leatherwork 6 | COURSE NUMBER: 8748060

COURSE DESCRIPTION:

This course is designed to provide knowledge of the free enterprise system, and to develop employability skills.

10.0 DEMONSTRATE KNOWLEDGE OF THE FREE ENTERPRISE SYSTEM: The student will be able to:

10.01 State the importance of the free enterprise system to the economy
10.02 State the role of the shoe repair and leatherwork industry within the free enterprise system

11.0 DEMONSTRATE EMPLOYABILITY SKILLS: The student will be able to:

11.01 Conduct a job search
11.02 Secure information about a job
11.03 Identify documents that may be required when applying for a job
11.04 Complete a job application form correctly
11.05 Demonstrate competence in job interview techniques
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons
11.07 Identify acceptable work habits
11.08 Demonstrate knowledge of how to make job changes appropriately
11.09 Demonstrate acceptable employee health habits

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP: The student will be able to:

12.01 Define entrepreneurship
12.02 Describe the importance of entrepreneurship to the American economy
12.03 List the advantages and disadvantages of business ownership
12.04 Identify the risks involved in ownership of a business
12.05 Identify the necessary personal characteristics of a successful entrepreneur
12.06 Identify the business skills needed to operate a small business efficiently and effectively

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CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Solar Heating and Cooling Technology

CODE NUMBER: Secondary ______ Postsecondary AET0240

Florida CIP IN15.050500

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ______7-9 ______9-12 ______Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-15

CERTIFICATION COVERAGE: SOLAR TEC 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as all other engineering technicians (10081808), solar engineering technicians, heating technicians (007.181-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, solar system planning, installation, repair and maintenance, prevailing building codes, and retrofitting existing structures with solar systems.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in design, installation, and testing of solar equipment assemblies.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1620 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Read and interpret blueprints, schematics, and building codes.
02. Demonstrate basic plumbing skills.
03. Demonstrate basic carpentry and roofing skills.
04. Demonstrate basic electrical skills.
05. Demonstrate knowledge of basic control systems.
06. Demonstrate knowledge of prevailing building codes.
07. Assist with the design, installation and testing of solar equipment systems.

08. Troubleshoot malfunctioning active and passive solar heating systems.
09. Perform cost estimates.
10. Perform cost comparisons of alternative systems.
11. Prepare, analyze, and evaluate technical reports and data.
12. Demonstrate knowledge of insulating and conductive properties of materials.
13. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS

Solar Heating and Cooling Technology

01.0 READ AND INTERPRET BLUEPRINTS AND SCHEMATICS — The student will be able to:

01.01 Identify architectual symbols.
01.02 Identify electrical symbols.
01.03 Identify mechanical symbols.
01.04 Identify topo graphical symbols.
01.05 Interpret land surveyor's notes.
01.06 Interpret architectual drawings and specifications.
01.07 Interpret structural drawings.
01.08 Apply A.S.T.M. standards.
01.09 Apply C.S.A. standards.
01.10 Evaluate shop drawings.
01.11 Interpret mechanical drawings.
01.12 Interpret electrical drawings.

02.0 DEMONSTRATE BASIC PLUMBING SKILLS — The student will be able to:

02.01 Braze alumunum tubing.
02.02 Cut copper tubing.
02.03 Bend copper tubing.
02.04 Braze weld copper tubing.
02.05 Cut steel pipe.
02.06 Cut PVC pipe.
02.07 Dislodge obstructions from tubing.
02.08 Flare copper tubing.
02.09 Braze two metal joints.
02.10 Assemble specialized fittings.
02.11 Install pipe.
02.12 Secure pipe to various surfaces.
02.13 Insulate water pipes.
02.14 Pressure test water system.
02.15 Select appropriate water system components.

03.0 DEMONSTRATE BASIC CAPENTRY AND ROOFING SKILLS — The student will be able to:

03.01 Estimate materials.
03.02 Maintain tools as needed.
03.03 Install rough frame.
03.04 Install diagnol bracing.
03.05 Construct roof truss.
03.06 Install collar beams.
03.07 Install rafters.
03.08 Install roofing felt.
03.09 Install shingles.
03.10 Operate hand tools.
03.11 Cut materials to size.

04.0 DEMONSTRATE BASIC ELECTRICAL SKILLS — The student will be able to:

04.01 Calculate circuit load.
04.02 Select conductors.
04.03 Connect wiring to specified terminals.
04.04 Install circuit box.
04.05 Ground electrical system.
04.06 Install outlets.

05.0 DEMONSTRATE KNOWLEDGE OF BASIC CONTROL SYSTEMS — The student will be able to:

05.01 Mount temperature sensors.
05.02 Install central wiring.
05.03 Install valve operators.
05.04 Install damper operators.
05.05 Calibrate sensors.

06.0 DEMONSTRATE KNOWLEDGE OF PREVAILING BUILDING CODES — The student will be able to:

06.01 Apply O.S.H.A. standard.
06/02 Aply local codes.
06.03 Interpret application of regulations.

07.0 ASSIST WITH DESIGN, INSTALLATION AND TESTING OF SOLAR EQUIPMENT — The student will be able to:

07.01 Select heat storage unit.
07.02 Select auxilliary boiler.
07.03 Design collector system.
07.04 Design heat transfer medium.
07.05 Postion dampers.
07.06 Install control blowers.
07.07 Install louvre-type dampers.
07.08 Install back-draft dampers.
07.09 Design filters.
07.10 Design duct installation.
07.11 Construct pebble bed containers.

08.0 TROUBLESHOOT MALFUNCTIONING ACTIVE AND PASSIVE SOLOR HEATING SYSTEM. — The student will be able to:

08.01 Check conditions of collectors and heat exchangers.
08.02 Check piping, storage tanks and pumps.
08.03 Evaluate valves for leakage.
08.04 Evaluate condition of insulation.
08.05 Check fluid levels.
08.06 Check antifreeze concentration in collector circuit.
08.07 Lubricate pump and blower motors.
08.08 Align blowers wheels.
08.09 Clean air filters.
08.10 Adjust air-flow.
08.11 Check control system for sensing.

09.0 PERFORM COST ESTIMATES — The student will be able to:

09.01 Read supply catalogs.
09.02 Price labor costs.
09.03 Determine profit margin.
09.04 Schedule time required.
09.05 Calculate total expenses.
09.06 Develop actual consumer cost.

10.0 PERFORM COST COMPARISONS OF ALTERNATIVE SYSTEMS — The student will be able:

10.01 Identify other solar systems.
10.02 Compare characteristics as needed.
10.03 Analyze costs.

11.0 PREPARE ANALYZE AND EVALUATE TECHNICAL REPORTS AND DATE — The student will be able to:

11.01 Write description of system design.
11.02 Collect specification data from operable system.
11.03 Evaluate operation of system.

12.0 DEMONSTRATE KNOWLEDGE OF INSULATING AND CONDUCTION PROPERTIES OF MATERIALS — The student will be able to:

12.01 Identify various insulations.
12.02 Select appropriate insulations based on system design.
12.03 Install various insulations.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS—The student will be able to:

13.01 List sources of job openings other than public or private employment agencies
13.02 Write a letter of application for a job
13.03 Prepare a vita, resume or personal fact sheet
13.04 List factors to consider when applying for a job
13.05 List ways of making contact with employers
13.06 Identify documents which may be required when applying for a job inview
13.07 Complete a job application form correctly
13.08 Identify appropriate dress and grooming for job interview
13.09 Classify behaviors considered appropriate or inappropriate in a job interview situation

13.10 Describe advantages to employer and employees of being a productive worker
13.11 Explain the purpose of supervision, self discipline and performance evaluation
13.12 Identify appropriate response(s) to criticism from employer supervisor or other employees
13.13 List consequences of being absent frequently from the job
13.14 List consequences of frequently arriving late for work
13.15 List factors to consider when resigning from a job
13.16 Write a letter of resignation

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Stationary Energy Systems

CODE NUMBER: Secondary _______ Postsecondary EET0500

Florida CIP IN47.050100

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational X Other 13-17

CERTIFICATION COVERAGE: SANT ENGR @ 7 STA ENGR 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as stationary engineers (950.382-026), diesel plant operators (952.382-010), refrigerating engineers (950.362-014), power plant operators (952.382-018), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the operation and maintenance of large power sources used for purposes as generating electricity, pumping, and heating and cooling.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the operation of various types of power plant equipment including stationary engines, boilers, pumps, compressors, motors and generators used to provide heat, refrigeration, power and other utility services in buildings or for industrial processes.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1620 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Perform refrigeration engineer activities.
02. Perform stationary engineer duties.
03. Perform boiler room duties.
04. Detect and correct operational malfunctions.
05. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________
PROGRAM TITLE: Stationary Energy Systems POSTSECONDARY NUMBER: EET0500

01.0 PERFORM REFRIGERATION ENGINEER ACTIVITIES--The student will be able to:

01.01 Operate freon, carbon-dioxide, and ammonia gas cooling systems.
01.02 Open valves on equipment.
01.03 Start-up equipment and auxiliary machinery.
01.04 Observe temperature and ampere reading.
01.05 Adjust controls to specifications.
01.06 Perform overide of automatic controls.
01.07 Maintain operational logs.
01.08 Measure density of brine using hydrometer.
01.09 Lower temperature to specified degree.
01.10 Connect hoses.
01.11 Inspect and maintain equipment.
01.12 Operate hand tools.

02.0 PERFORM STATIONARY ENGINEER DUTIES--The student will be able to:

02.01 Operate steam engines, air compressors, generators, motors, turbines and steam boilers.
02.02 Interpret meters and gauges.
02.03 Record operational data for fuel consumption, temperature, levels, gases, load, and balance.
02.04 Adjust manual controls as needed.
02.05 Operate back-up equipment.
02.06 Repack bearings as needed.
02.07 Replace gaskets, valves and gauges.
02.08 Clean burners and other components.
02.09 Use hand and power tools.
02.10 Oil and lubricate equipment as needed.
02.11 Perform water titration tests as needed.

03.0 PERFORM BOILER ROOM DUTIES--The student will be able to:

03.01 Operate fire boilers to generate steam.
03.02 Operate torch to light burners.
03.03 Grind and fee coal as necessary.
03.04 Operate pulverizer and stoker.
03.05 Observe pressure and draft meters.
03.06 Operate diesel-electric generating unit.
03.07 Start diesel engine.
03.08 Synchronize generators with other power sources.
03.09 Tighten pipes and fittings.
03.10 Treat boiler feed water.

04.0 DETECT AND CORRECT OPERATIONAL MALFUNCTIONS--The student will be able to:

04.01 Monitor gauges, meters, warning lights and alarms.
04.02 Identify function of warning devices.
04.03 Make minor adjustments as needed.
04.04 Check output efficiency o[illegible]stem.
04.05 Verify flow rates as needed.

05.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

05.01 Conduct a job search.
05.02 Secure information about a job.
05.03 Identify documents which may be required when applying for a job interview.
05.04 Complete a job application form correctly.
05.05 Demonstrate competence in job interview techniques.
05.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
05.07 Identify acceptable work habits.
05.08 Demonstrate knowledge of how to make job changes appropriately.
05.09 Demonstrate acceptable employee health habits.

CURRICULUM FRAMEWORK
PROGRAM AREA: Industrial
FLORIDA DEPARTMENT OF EDUCATION
EFFECTIVE DATE: July, 1987
PROGRAM TITLE: Structural Steel Work
CODE NUMBER: Secondary ______ Postsecondary BCN0430
Florida CIP IN48.059902

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational
______ Postsecondary Vocational x Other 13-17

CERTIFICATION COVERAGE: TEC CONSTR @ 7 STRL STEEL 7
BLDG CONST @ 7 METAL WORK @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as welders and flame cutters (61022002), structural steel workers (50023800), ironworkers (801.361-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, direct hands-on training procedure with cranes, rigging and direct placement of structural and rebar steel.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in safety, use of blueprints, cutting, welding, and placement of rebar.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1200 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Erect ornamental iron.
02. Fabricate reinforcing.
03. Erect structural steel.
04. Perform rigging operations.
05. Perform reeving operations.
06. Identify proper sling use.
07. Perform heavy rigging.
08. Access structures.
09. Read and interpret blueprints.

10. Perform welding operations.
11. Erect steel fences.
12. Apply metal decking.
13. Identify proper use of fiber line.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial SECONDARY NUMBER: ________
PROGRAM TITLE: Structural Steel Work POSTSECONDARY NUMBER: BCN0430

01.0 ERECT ORNAMENTAL IRON--The student will be able to:

01.01 Understand the use of squares, levels, transits, rulers and other tools for preparing layout work.
01.02 Identify various types of doors and frames that are used in iron working.
01.03 Demonstrate how to erect doors and frames.
01.04 Identify types of gratings and grills and methods of installing them.
01.05 Identify types of handrails and methods of installing them.
01.06 Identify types of stairways and rails and methods of installing them.

02.0 FABRICATE REINFORCING STEEL--The student will be able to:

02.01 Fabricate reinforcing steel.
02.02 Erect, place and tie reinforcing steel.

03.0 ERECT STRUCTURAL STEEL--The student will be able to:

03.01 Identify various connections of beams, columns, and any other structural members.
03.02 Execute connections of beams, columns, and other structural members.
03.03 Execute proper method of hooking steel beams and columns for hoisting in building erection.
03.04 Demonstrate correct hand signals for all cranes, derricks and gin poles.
03.05 Assemble various types of cranes, derrickand gin poles.
03.06 Identify types of splices used for all phases of wire rope.
03.07 Demonstrate all types of splicing for wire rope.

04.0 PERFORM RIGGING OPERATIONS--The student will be able to:

04.01 Identify rigging hardware.
04.02 Describe and demonstrate, when possible, rigging applications.

05.0 PERFORM REEVING OPERATIONS--The student will be able to:

05.01 Identify different types of blocks and their safe working load.
05.02 Compute the mechanical advantages of compound tackle systems.
05.03 Reeve and lace wire rope through the blocks and sheaves.

06.0 IDENTIFY PROPER SLING USE--The student will be able to:

06.01 Identify types of slings.
06.02 Identify practical uses of slings.

07.0 PERFORM HEAVING RIGGING--The student will be able to:

07.01 Identify center of gravity and picking points for heavy loads.
07.02 Identify methods to hoist heavy loads correctly into place.

08.0 ACCESS STRUCTURES--The student will be able to:

08.01 Identify access structures.
08.02 Identify methods of rigging access structures.

09.0 READ AND INTERPRET BLUEPRINTS--The student will be able to:

09.01 Identify types of blueprints.
09.02 Identify blueprint symbols, abbreviations, markings and details.
09.03 Identify control and measurement lines.
09.04 Understand the translation from blueprint to practical use.

10.0 PERFORM WELDING OPERATIONS--The student will be able to:

10.01 Identify types of welds.
10.02 Identify types of welding machines, rods and wires.
10.03 Demonstrate practical application of various types of welding procedures on ferrous and non-ferrous metals to enable students to pass welding certification tests.

10.04 Understand the principles of free-standing towers and guy towers and the methods of erecting them.

11.0 ERECT STEEL FENCES--The student will be able to:

11.01 Layout steel fences.
11.02 Erect steel fences.

12.0 APPLY METAL DECKING--The student will be able to:

12.01 Identify various types of metal decking and sheeting.
12.02 Understand proper handling of placing of metal decking sheeting.
12.03 Demonstrate proper placing or erection techniques for metal decking and sheeting.

13.0 IDENTIFY PROPER USE OF FIBER LINE--The student will be able to:

13.01 Identify all types of fiber line,
13.02 Understand the effects of climate on fiber line.
13.03 Identify various types of knots, their uses, and advantages and disadvantages.
13.04 Demonstrate various splices, knots, bends and hitches.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Surveying and Mapping Technology

CODE NUMBER: Secondary ______ Postsecondary SUR0800

Florida CIP IN15.020300

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-15

CERTIFICATION COVERAGE: TEC CONSTR @ 7 BLDG CONST @ 7 SURVEY 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as surveyors (10081600), surveyors helpers (61081000) or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, recordkeeping skills and mathematics, and use of surveying equipment to perform measurement activities.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in chaining, rod and level activities, angle measurement, electronic distance measurement, land surveying and construction layout.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1980 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Measure land using chains and tape.
02. Perform rod and level activities.
03. Perform angle measurement activities.
04. Perform electronic distance measurement activities.
05. Perform land surveying activities.
06. Perform construction stake out activities.
07. Perform supervisory functions.
08. Determine methods and procedures for establishing survey control.
09. Develop sketches and drawings.
10. Research previous survey evidence

11. Compute volumes and areas.
12. Read, interpret, and write descriptions of land.
13. Prepare charts and tables.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Surveying and Mapping Technology POSTSECONDARY NUMBER: SUR0800

01.0 MEASURE LAND USING CHAINS AND TAPE--The student will be able to:

01.01 Clear brush to establish line of sight.
01.02 Hold the chain/tape over a point.
01.03 Pull the chain/tape.
01.04 Wind the chain/tape on reel.
01.05 Set the marker.
01.06 Loop and throw the unreeled chain/tape.
01.07 Establish a line perpendicular to an existing line at a given point using a right angle prism.
01.08 Establish elevation using a hand (Locke) level.
01.09 Test and standardize the chain/tape.

02.0 PERFORM ROD AND LEVEL ACTIVITIES--The student will be able to:

02.01 Plumb the rod.
02.02 Obtain a rod reading using a target.
02.03 Obtain a rod reading with using a target.
02.04 Establish a turning point/benchmark.
02.05 Set up the level.
02.06 Test the level.

03.0 PERFORM ANGLE MEASUREMENT ACTIVITIES--The student will be able to:

03.01 Set up a transit/theodolite over a point.
03.02 Measure a horizontal angle.
03.03 Measure a vertical angle.
03.04 Lay out a horizontal angle.
03.05 Lay out a vertical angle.
03.06 Read a compass bearing.
03.07 Adjust transit/theodolite leveling bubbles.
03.08 Adjust transit/theodolite vertical cross-hair by double centering.
03.09 Adjust transit/theodolite vertical cross-hair for vertical accuracy.

04.0 PERFORM ELECTRONIC DISTANCE MEASUREMENT ACTIVITIES--The student will be able to:

04.01 Test accuracy of instrument against a known point.
04.02 Set up EDM.
04.03 Obtain scope distance and compute horizontal distance.
04.04 Set up reflector.

05.0 PERFORM LAND SURVEYING ACTIVITIES--The student will be able to:

05.01 Determine horizontal distance by the stadia method.
05.02 Determine elevation by the stadia method.
05.03 Locate detail be angle and distance using a transit/theodolite.
05.04 Locate detail by the use of a plane table and alidade.
05.05 Establish property corners from deed descriptions or plat.
05.06 Secure a deed from the courthouse.

06.0 PERFORM CONSTRUCTION STAKE OUT ACTIVITIES--The student will be able to:

06.01 Establish horizontal control.
06.02 Establish vertical control.
06.03 Stake out horizontal curves.
06.04 Determine elevations for vertical curves.
06.05 Establish slope stakes.

07.0 PERFORM SUPERVISORY FUNCTIONS--The student will be able to:

07.01 Demonstrate equipment use.
07.02 Inventory field supplies and equipment.
07.03 Select equipment.
07.04 Evaluate personnel
07.05 Schedule work.
07.06 Perform mathematical checks on field work.
07.07 Keep field notes.

08.0 DETERMINE METHODS AND PROCEDURES FOR ESTABLISHING SURVEY CONTROL--The student will be able to:

08.01 Understand and apply methods of distance measurements.
08.02 Understand and apply methods of angle measurements.
08.03 Understand and apply azimuth determination.
08.04 Understand and apply closure computations.
08.05 Understand and apply adjustment of data.

09.0 DEVELOP SKETCHES AND DRAWINGS--The student will be able to:

09.01 Make lettering sketches to identify items.
09.02 Demonstrate inking procedures.
09.03 Identify map symbolism.
09.04 Define and interpret dimensioning.
09.05 Write a brief but adequate property description.

10.0 RESEARCH PREVIOUS SURVEY EVIDENCE--The student will be able to:

10.01 Be familiar with courthouse procedures.
10.02 Conduct a title search.
10.03 Demonstrate an understanding of deeds.
10.04 Search for record evidence.
10.05 Demonstrate proper resurvey processes.

11.0 COMPUTE VOLUMES AND AREAS--The student will be able to:

11.01 Compute an area by using trapezoids
11.02 Compute an area by using coordinates.
11.03 Compute an area of a curved surface.
11.04 Compute volumes of linear dimension surfaces.
11.05 Compute volumes of curved surfaces.

12.0 READ, INTERPRET, AND WRITE DESCRIPTIONS OF LAND--The student will be able to:

12.01 Prepare metes-and-bounds descriptions.
12.02 Understand the U.S. Public Land Survey System.
12.03 Understand and interpret sectionalized surveys.
12.04 Understand and interpret sectional breakdowns.
12.05 Understand and interpret standard deed information.

13.0 PREPARE CHARTS AND TABLES--The student will be able to:

13.01 Understand and prepare curve information.
13.02 Understand and prepare highway design information.
13.03 Understand and prepare standard control information.
13.04 Understand and prepare proper field notes.
13.05 Understand and prepare proper legend information.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK   PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION   EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Swimming Pool Maintenance

CODE NUMBER: Secondary ______   Postsecondary EVS0090

Florida CIP IN46.999903

SECONDARY SCHOOL CREDITS ______   COLLEGE CREDITS ______   POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __X__ Other 13-15

CERTIFICATION COVERAGE: POOL MAINT 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment as qualified and certified pool and spa maintenance contractors or certified pool operators. This program may also be used to provide supplemental training for persons previously or currently employed in this occupational area.

The content should include, but not be limited to, the safety storage, and handling of pool maintenance tools, equipment, and supplies; disease and Florida State Board of Health regulations; pool circulation and recirculation equipment; filters and filtration; required mathematics for swimming pool calculations; acid/base chemistry; alkalinity and hardness; water sanitizing and control agents; chlorinators and the chemistry of chlorination; bacteriacides stabilizers and other pool chemicals; water testing; swimming pool and spa maintenance; spas, hot tubs, and therapy pools; pool, spa, hot tub, and therapy pool problems; pool management and operation; energy conservation, management, and solar energy; occupational information; entrepreneurship; and employability skills.

II. LABORATORY ACTIVITIES: Instruction is provided in a realistic setting using hands-on experiences with the tools, equipment, and materials appropriate to the program content and in accordance with current practices in industry and governmental regulations.

III. SPECIAL NOTE: This program may be offered as to meet the needs of local employers and licensing requirements. A minimum of 40 classroom hours is usally required.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate the safe storage and use of pool and spa tools, equipment, and supplies.
02. Identify pool- and spa-related diseases and their prevention.
03. Identify and understand Florida State Board of Health (SBOH) regulations related to pool and spas.
04. Identify the major components of a circulation system and their general construction, function, and proper circulation in a pool.
05. Identify major types of filters, along with their construction and the function of their components.
06. Demonstrate competency in the mathematical operations required in swimming pool calculations.
07. Identify the characteristics and acid/base and other chemical interactions in water and their identification in chemical terms.
08. Identify alkalinity and "hardness" in water.
09. Identify the types and characteristics of chlorinators.
10. Identify the characteristics and the chemistry of chlorine in relation to swimming pools.
11. Identify the characteristics of bacteriacides and stabilizers.
12. Perform water tests.
13. Identify other pool chemicals along with their functions and applications.
14. Perform swimming pool maintenance.
15. Perform special maintenance for spas, hot tubs, and therapy pools.

16. Identify common problems and appropriate solutions for pools, spas, hot tubs, and therapy pools.
17. Identify correct principles of energy conservation and management, including the use of solar energy.
18. Identify common occupations found in the swimming pool and spa industry, along with their occupational requirements and availability and the possibilities of owning a business in the industry.
19. Demonstrate employability skills.
20. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Swimming Pool Maintenance POSTSECONDARY NUMBER: EVS0090

01.0 DEMONSTRATE THE SAFE STORAGE AND USE OF POOL AND SPA TOOLS, EQUIPMENT, AND SUPPLIES--The student will be able to:

01.01 Identify swimming-pool maintenance tools and equipment by name and function.
01.02 Demonstrate proper and safe handling of tools, equipment, and supplies so as to protect the user and others from fire, electrical shock, and other injuries.
01.03 Identify possible injury which can be cause by improper storage or use of pool/spa chemicals and other materials.
01.04 Demonstrate proper care and storage and use of pool/spa supplies.

02.0 IDENTIFY POOL- AND SPA-RELATED DISEASES AND THEIR PREVENTION--The student will be able to:

02.01 Identify pool/spa conditions which may cause disease.
02.02 Select appropriate remedies for pool/spa conditions which might cause diseases.

03.0 IDENTIFY AND UNDERSTAND FLORIDA STATE BOARD OF HEALTH (SBOH) REGULATIONS RELATED TO POOLS AND SPAS--The student will be able to:

03.01 Apply SBOH regulations governing water quality in public pools.
03.02 Apply SBOH requirements for recirculation; piping and hydraulics; filters; chemical feeders; hydrotherapy, whirlpools, spas, and wading pools; diving areas; lighting; bathing load; and spectators related to public pools.
03.03 Identify the function of an inspection by the Health Department and the consequences of noncompliance.

04.0 IDENTIFY THE MAJOR COMPONENTS OF A CIRCULATION SYSTEM AND THEIR GENERAL CONSTRUCTION, FUNCTION, AND PROPER CIRCULATION IN A POOL--The student will be able to:

04.01 Identify the major components of a standard circulation system and the function of each component.
04.02 Identify the major subcomponents (of each component) in a standard circulation system and the purpose of each.
04.03 Identify the function of each of the following pieces of recirculation equipment: flow rate meter and bypass; gauges; valves; surge tanks; and hair and lint strainers.
04.04 Identify proper circulation in a swimming pool.
04.05 Identify a centrifugal pump and curve.

05.0 IDENTIFY MAJOR TYPES OF FILTERS, ALONG WITH THEIR CONSTRUCTION AND THE FUNCTION OF THEIR COMPONENTS--The student will be able to:

05.01 Identify and describe the unique characteristics of sand, diatomaceous earth, and cartridge filters.
05.02 Identify the significance of gravity, rapid flow, and high rate in a sand filter.
05.03 Identify the significance of pressure and a vacuum in a diatomaceous earth filter.

06.0 DEMONSTRATE COMPETENCY IN MATHEMATICAL OPERATIONS REQUIRED IN SWIMMING POOL CALCULATIONS--The student will be able to:

06.01 Calculate the volume of water.
06.02 Calculate filter surface area.
06.03 Calculate pool capacity.
06.04 Calculate turnover rate.
06.05 Calculate flow rate and convert to gallons per minute.
06.06 Calculate swimmer load.
06.07 Calculate pool leaks and make-up water.
06.08 Calculate chemical dosage.
06.09 Calculate temperature conversion.

07.0 IDENTIFY THE CHARACTERISTIC OF ACID/BASE AND OTHER CHEMICAL INTERACTIONS IN WATER AND THEIR IDENTIFICATION IN CHEMICAL TERMS--The student will be able to:

07.01 Identify the concept pH in terms of acids and bases present in water.
07.02 Identify the proper procedure for controlling the balance between acids and bases in water.
07.03 Identify the relationship of chlorine and pH in water.
07.04 Identify corrosion, state how it occurs, and list the varieties of corrosion and galvenic series.
07.05 Demonstrate methods to prevent or retard corrosion.

08.0 IDENTIFY ALKALINITY AND "HARDNESS" IN WATER--The student will be able to:

08.01 Identify alkalinity in pool water.
08.02 Identify permanent and temporary alkalinity.
08.03 Demonstrate procedures for control of total alkalinity.

09.0 IDENTIFY THE TYPES OF CHARACTERISTICS OF CHLORINATORS--The student will be able to:

09.01 Identify the distinguishing characteristics of a hypochlorinator.
09.02 Identify the distinguishing characteristics of a gas chlorinator.
09.03 Identify the distinguishing characteristics of an erosion feed chlorinator.

10.0 IDENTIFY THE CHARACTERISTICS AND THE CHEMISTRY OF CHLORINE IN RELATION TO SWIMMING POOLS--The student will be able to:

10.01 Identify the products of chlorine combined with other substances in pool water.
10.02 Identify residual chlorine in pool water.
10.03 Identify the characteristics of solution chlorine.
10.04 Identify the characteristics of chlorine in the form of a gas.
10.05 Identify the characteristics of chlorine in powder form.
10.06 Identify the distinguishing characteristics of chloramines.
10.07 Identify the effects of the sun on chlorine in pool water.

11.0 IDENTIFY THE CHARACTERISTICS OF BACTERIACIDES AND STABILIZERS--The student will be able to:

11.01 Identify the effects of bromine and bromides and the chemical interactions with other substances in pool water.
11.02 Identify the effects of iodine and the chemical interactions with other substances in pool water.
11.03 Identify other commonly used methods of sanitation.

12.0 PERFORM WATER TESTS--The student will be able to:

12.01 Identify commonly used water test kits and their distinguishing characteristics.
12.02 Test for free chlorine and take appropriate action.
12.03 Conduct the cyanuric test and take appropriate action.
12.04 Test for total alkalinity and take appropriate action.
12.05 Conduct other commonly used water tests.

13.0 IDENTIFY OTHER POOL CHEMICALS, ALONG WITH THEIR FUNCTIONS AND APPLICATIONS--The student will be able to:

13.01 Identify commonly used algaecides and their functions.
13.02 Demonstrate proper procedures for applying algaecides.
13.03 Identify commonly used flocculents and their functions.
13.04 Demonstrate proper procedures for applying flocculents.
13.05 Identify common sequestering agents and their functions.
13.06 Demonstrate the proper procedure for applying sequestering agents.

14.0 PERFORM SWIMMING POOL MAINTENANCE--The student will be able to:

14.01 Inspect and clean pool surface.
14.02 Inspect and clean or repair a pool deck.
14.03 Inspect and clean or repair water barriers.
14.04 Inspect and clean or repair pool walls, troughs, and skimmers.
14.05 Inspect and clean or repair a pool bottom.
14.06 Inspect and clean/repair or replace a diving board and slide.

14.07 Inspect and clean or repair lights.
14.08 Inspect and service a filter pump.
14.09 Inspect, remove, and replace motors.
14.10 Inspect and clean or repair a hair and lint strainer.
14.11 Inspect and replace pressure gauges.
14.12 Inspect and service, clean, or repair a chemical feeder.
14.13 Inspect and service or repair gas and other chlorinators.
14.14 Inspect and service or repair a water heater.
14.15 Inspect and clean or repair a valve.

15.0 PERFORM SPECIAL MAINTENANCE FOR SPAS, HOT TUBS, AND THERAPY POOLS--The student will be able to:

15.01 Identify and control bacterial growth, including pseudomona aeruginosa.
15.02 Measure and adjust the chlorine level.
15.03 Inspect and adjust circulation.
15.04 Identify hyperthermia and preventive action with timer.
15.05 Identify and correct hair entrapment and entanglement.
15.06 Install appropriate warning and safety signs.
15.07 Select appropriate heater size.
15.08 Demonstrate appropriate record keeping.

16.0 IDENTIFY COMMON PROBLEMS AND APPROPRIATE SOLUTIONS FOR POOLS, SPAS, HOT TUBS, AND THERAPY POOLS--The student will be able to:

16.01 Identify and correct common hydraulic problems.
16.02 Identify and correct common electrical problems.
16.03 Identify and correct common mechanical problems.
16.04 Identify and correct common temperature problems.
16.05 Identify and correct common humidity problems.
16.06 Identify and correct common pool shell problems.
16.07 Identify and correct common water clarity problems.
16.08 Identify and correct common pool water problems.
16.09 Identify and correct common filter problems.

17.0 IDENTIFY CORRECT PRINCIPLES OF ENERGY CONSERVATION AND MANAGEMENT, INCLUDING THE USE OF SOLAR ENERGY--The student will be able to:

17.01 Identify types and factors affecting heat loss.
17.02 Identify appropriate situations for the use of a pool blanket.
17.03 Identify and perform appropriate procedures for conserving energy through circulation, filtration, lighting, heating, pool shelters, and using the swimming season.
17.04 Identify and install appropriate solar collectors.

18.0 IDENTIFY COMMON OCCUPATIONS FOUND IN THE SWIMMING POOL AND SPA INDUSTRY, ALONG WITH THEIR OCCUPATIONAL REQUIREMENTS AND AVAILABILITY, AND THE POSSIBILITIES OF OWNING A BUSINESS IN THE INDUSTRY--The student will be able to:

18.01 Identify the requirements and availability of certified swimming pool and spa maintenance contractor jobs.
18.02 Identify the requirements for going into business as a certified swimming pool maintenance contractor.
18.03 Identify the requirements for being certified (at municipal, county, and/or state level(s) as a pool operator.

19.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

19.01 Conduct a job search.
19.02 Secure information about a job.
19.03 Identify documents which may be required when applying for a job interview.
19.04 Complete a job application form correctly.
19.05 Demonstrate competence in job interview techniques.
19.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
19.07 Identify acceptable work habits.
19.08 Demonstrate knowledge of how to make job changes appropriately.
19.09 Demonstrate acceptable employee health habits.

20.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

20.01 Define entrepreneurship.
20.02 Describe the importance of entrepreneurship to the American economy.
20.03 List the advantages and disadvantages of business ownership.
20.04 Identify the risks involved in ownership of a business.
20.05 Identify the necessary personal characteristics of a successful entrepreneur.
20.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK　PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION　EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Technical Illustration

CODE NUMBER: Secondary ______　Postsecondary ETV0800

Florida CIP IN50.040300

SECONDARY SCHOOL CREDITS ______　COLLEGE CREDITS ______　POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9　____9-12　____Postsecondary Adult Vocational

______ Postsecondary Vocational　x Other 13-15

CERTIFICATION COVERAGE: PRINTING 7　COMM ART 7　BLDG CONST @ 7
TEC CONSTR @ 7　TEC DRAFT @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as commercial artists (10221601), technical illustrators (017.281-034), scientific illustrators (141.061-026), illustrators (141.061-022), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, blueprint reading skills, freehand technical sketching, advanced perspective drawings, true-position drawing skills, rendering and shadow projection techniques, inking and lettering skills, electronic drawings, airbrush illustration skills, and technical mathematics.

II. LABORATORY ACTIVITIES: Laboratory activities include development of sketches, perspective drawings and application of basic drafting skills to produce full color technically oriented illustrations.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 12.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1500 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Read and interpret blueprints.
02. Prepare freehand technical sketches.
03. Prepare perspective drawings.
04. Apply true-position drafting skills.
05. Prepare dimensioned drawings in true-position.
06. Apply rendering and shadow projection techniques.
07. Apply inking and lettering skills.
08. Prepare electronic drawings.

09. Prepare full color illustrations.
10. Prepare airbrush illustrations.
11. Prepare a technical illustration project.
12. Prepare a portfolio.
13. Apply technical mathematics.
14. Demonstrate employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial — SECONDARY NUMBER: ________
PROGRAM TITLE: Technical Illustration — POSTSECONDARY NUMBER: ETV0800

01.0 APPLY BLUEPRINT READING SKILLS--The student will be able to:

01.01 Read and interpret detail shop drawings.
01.02 Read and interpret assembly drawings.
01.03 Read and interpret sectioned drawings.
01.04 Read and interpret dimensions with fraction, decimal and metric tolerances.
01.05 Read and interpret data in title blocks, material and parts lists.

02.0 PREPARE FREEHAND TECHNICAL SKETCHES--The student will be able to:

02.01 Prepare orthographic sketches.
02.02 Prepare black and white rendered sketches.
02.03 Prepare colored rendered sketches.

03.0 PREPARE ADVANCED PERSPECTIVE DRAWINGS--The student will be able to:

03.01 Prepare one-point perspective drawings.
03.02 Prepare two-point measured perspective drawings.
03.03 Prepare three-point measured perspective drawings.

04.0 APPLY TRUE-POSITION DRAFTING SKILLS--The student will be able to:

04.01 Prepare forshortening skills.
04.02 Prepare elliptical circle diagrams.
04.03 Prepare drawings using isometric drafting instruments.
04.04 Prepare drawings using dimetric drafting instruments.
04.05 Prepare drawings using trimetric drafting instruments.
04.06 Prepare drawings with oblique lines and planes in true-position.
04.07 Measure drawings using the oblique line scaler.
04.08 Prepare true-position drawings for gears and splines.
04.09 Prepare true-position drawings for helixes and compound curves and angles.

05.0 PREPARE DIMENSIONED DRAWINGS IN TRUE-POSITION--The student will be able to:

05.01 Prepare drawings with undirectional and planar dimensions.
05.02 Prepare drawings with tabular dimensions.
05.03 Prepare drawings with coordinate or datum dimensions.
05.04 Prepare drawings with geometric symbols and tolerances.

06.0 APPLY RENDERING AND SHADOW PROJECTION TECHNIQUES--The student will be able to:

06.01 Prepare drawings in color using high-lights.
06.02 Prepare drawings using orthographic shadow projection.
06.03 Prepare drawings using 3-dimensional shadow projection.

07.0 APPLY INKING AND LETTERING SKILLS--The student will be able to:

07.01 Use technical pens.
07.02 Use the Leroy lettering set.
07.03 Use the WRICO lettering guide.
07.04 Use speed-ball lettering pen points.
07.05 Prepare true-position drawings in ink on vellum and mylar surfaces.
07.06 Prepare freehand technical sketches in ink.

08.0 PREPARE ELECTRONIC DRAWINGS--The student will be able to:

08.01 Identify and apply electronic symbols to diagrams and drawings.
08.02 Prepare schematic diagrams.
08.03 Prepare pictorial drawings in color.
08.04 Prepare printed circuit board drawings.

09.0 PREPARE FULL COLOR ILLUSTRATIONS--The student will be able to:

09.01 Identify and apply primary, secondary and complementary colors.
09.02 Prepare a simple color-wheel chart.
09.03 Prepare illustrations using water colors and brushes.
09.04 Prepare illustrations using color-pencils and pastels.
09.05 Prepare freehand technical sketches in color.

10.0 PREPARE AIRBRUSH ILLUSTRATIONS--The student will be able to:

10.01 Identify and prepare airbrush equipment for operation.
10.02 Prepare dot, line and tone pattern chart.
10.03 Prepare a grade tone chart.
10.04 Prepare friskit and tape masking for airbrush illustrations.
10.05 Prepare a 3-dimensional chart for geometric solids.
10.06 Prepare a selected full color airbrush illustration.

11.0 PREPARE A TECHNICAL ILLUSTRATION PROJECT--The student will be able to:

11.01 Research and select a technical subject (device).
11.02 Prepare appropriate equipment and materials.
11.03 Prepare preliminary sketches and drawings.
11.04 Prepare orthograph and exploded view drawings.
11.05 Prepare full-color presentation of subject.

12.0 PREPARE A PORTFOLIO--The student will be able to:

12.01 Select and purchase appropriate portfolio.
12.02 Select quality drawings and illustration for the portfolio.
12.03 Organize the portfolio for quick and easy presentation.

13.0 APPLY TECHNICAL MATHEMATICS--The student will be able to:

13.01 Solve arithmetic problems.
13.02 Solve algebra problems.
13.03 Solve geometry problems.
13.04 Solve trigonometry problems.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents which may be required when applying for a job interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Technical Writing - Publications Technology

CODE NUMBER: Secondary ______ Postsecondary ENC0200

Florida CIP IN50.080200

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-15

CERTIFICATION COVERAGE: PRINTING 7 TEC CONSTR @ 7
REPORT WRI @ 7 BLDG CONST @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for initial employment with occupational titles as technical publications writers (131.267-026), or to provide supplemental training for persons previously or currently employed in these occupations.

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and revising, editing, and writing materials for technical and administrative publications concerned with work methods and procedures, and installation, operation, and maintenance of machinery and other equipment.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in developing technically oriented materials through interpretation of processes, blueprints, interviews, and notes. Activities include preparing final script and supporting illustrations to be printed.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 10.0, Language 12.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate understanding of procedures.
02. Develop and write material.
03. Edit technical material.
04. Perform research.
05. Interpret blueprints and schematics.
06. Revise printed materials.
07. Lay out work to be printed.
08. Demonstrate employability skills.
09. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS
PROGRAM AREA: Industrial Education
PROGRAM TITLE: Technical Writing - Publications Technology

EFFECTIVE DATE: July, 1987
SECONDARY NUMBER: ________
POSTSECONDARY NUMBER: ENC0200

01.0 DEMONSTRATE UNDERSTANDING OF PROCEDURES--The student will be able to:

01.01 Apply school and class rules and procedures.
01.02 Apply rules and procedures used in business and industry for the occupation.

02.0 DEVELOP AND WRITE MATERIALS--The student will be able to:

02.01 Apply rules of grammar and word usage.
02.02 Use sentences and paragraphs effectively.
02.03 Spell words correctly.
02.04 Write paragraphs exemplifying the qualities of unity and coherence, and using emphasis effectively.
02.05 Identify the need for a publication.
02.06 Define the audience to read a publication.
02.07 Select and rank the topics as appropriate.
02.08 Define the scope of the publication.
02.09 Develop the time frame for development.
02.10 Prepare a budget as necessary.
02.11 Apply standards.
02.12 Review existing literature.
02.13 Determine and consider resources.
02.14 Coordinate the project by maintaining monitoring, and reporting progress.
02.15 Schedule editorial and support services.
02.16 Choose vendors.
02.17 Receive and file source data.
02.18 Develop, revise, and edit drafts.
02.19 Group information into working units.
02.20 Prepare and revise an outline.
02.21 Utilize word processing system.
02.22 Develop a format for a publication.
02.23 Define and standardize terminology.
02.24 Comply with standards and specifications.
02.25 Match the level of vocabulary with the targeted audience.
02.26 Make notes for illustrations.
02.27 Specify types and styles for illustrations.
02.28 Prepare sketches as needed.
02.29 Write figures titles and photograph captions.
02.30 Prepare tables and charts.
02.31 Provide artists with source data.

03.0 EDIT TECHNICAL MATERIAL--The student will be able to:

03.01 Evaluate material for readability and correctness.
03.02 Validate the data.
03.03 Validate the data in illustrations.
03.04 Review and edit illustrations.
03.05 Conduct meetings for feedback, conflict resolution, and evaluation of suggested changes.

04.0 PERFORM RESEARCH--The student will be able to:

04.01 Interview sources of information.
04.02 Study relevant literature.
04.03 Participate hands-on experiences, if applicable.
04.04 Observe or walk through the process(es).
04.05 Use and evaluate models.
04.06 Simulate audience's situation.

05.0 INTERPRET BLUEPRINTS AND SCHEMATICS--The student will be able to:

05.01 Apply math skills.
05.02 Read scales and measuring instruments.
05.03 Read and interpret multiview drawings.
05.04 Read and interpret section views and details.
05.05 Read and interpret auxiliary views.
05.06 Read and interpret types of dimensions.
05.07 Read and interpret pictorial drawings.

05.08 Read and interpret supplementary information.
05.09 Read and interpret removable fastener drawings.
05.10 Read and interpret welding drawings.
05.11 Read and interpret geometric tolerances.
05.12 Read and interpret cam drawings.
05.13 Read and interpret gear drawings.
05.14 Read and interpret assembly and subassembly drawings.
05.15 Read and interpret detail drawings.
05.16 Read and interpret surface developments.
05.17 Read and interpret bearing drawings.
05.18 Read and interpret spring drawings.
05.19 Read and interpret casting drawings.
05.20 Read and interpret forging drawings.
05.21 Read and interpret tool drawings.
05.22 Read and interpret stamping drawings.
05.23 Read and interpret numerical control drawings.
05.24 Read and interpret computer aided drawings.
05.25 Read and interpret plot plans.
05.26 Read and interpret foundation plan drawings.
05.27 Read and interpret floor plan drawings.
05.28 Read and interpret elevation drawings.
05.29 Read and interpret schedules.
05.30 Read and interpret stair details.
05.31 Read and interpret fireplace details.
05.32 Read and interpret truss drawings.
05.33 Read and interpret roof framing plans.
05.34 Read and interpret electrical plans.
05.35 Read and interpret plumbing drawings.
05.36 Read and interpret heating/cooling plans.
05.37 Read and interpret landscape layout drawings.
05.38 Read and interpret specifications.
05.39 Read and interpret erection plans.
05.40 Read and interpret structural steel design drawings.
05.41 Read and interpret structural steel drawings.
05.42 Read and interpret concrete engineering drawings.
05.43 Read and interpret placing drawings.
05.44 Read and interpret schematic drawings.
05.45 Read and interpret printed circuit board drawings.
05.46 Read and interpret package drawings.
05.47 Read and interpret connection drawings.
05.48 Read and interpret interconnection drawings.
05.49 Read and interpret wiring lists.
05.50 Read and interpret cable drawings.
05.51 Read and interpret harness drawings.
05.52 Read and interpret component drawings.
05.53 Read and interpret logic diagrams.
05.54 Read and interpret block diagrams.
05.55 Read and interpret cutaway diagrams.
05.56 Read and interpret graphic diagrams.
05.57 Read and interpret combination diagrams.
05.58 Read and interpret traverse drawings.
05.59 Read and interpret plat drawings.
05.60 Read and interpret street layout drawings.
05.61 Read and interpret map drawings.
05.62 Read and interpret topographic drawings.
05.63 Identify construction codes and standards.
05.64 Identify mechanical standards.
05.65 Identify electronic standards.

06.0 REVISE PRINTED MATERIALS--The student will be able to:

06.01 Determine the requirements of the job.
06.02 Estimate the time to complete the job.
06.03 Calculate costs.
06.04 Make changes and rewrite the draft in the required format.

07.0 LAY OUT WORK TO BE PRINTED--The student will be able to:

07.01 Specify typography.
07.02 Prepare dummy copy.
07.03 Paginate the text.
07.04 Pasteup camera-ready copy.
07.05 Make photostats of art (i.e., PMT, velox, photostat).
07.06 Crop and size illustrations.

07.07 Strip and opaque negatives.
07.08 Proofread copy at each stage of production.
07.09 Secure final approvals.
07.10 Prepare a printer's dummy or approval copy.
07.11 Secure estimates from printers.
07.12 Evaluate estimates and prepare a contract.
07.13 Send camera-ready copy to the printer.
07.14 Secure and inspect negatives.
07.15 Inspect printer's work (bluelines, press proofs, or first page).
07.16 Solve problems with the printer.
07.17 Receive, check, and approve for payment the shipment from a printer.
07.18 Coordinate the distribution of print material.

08.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

08.01 Conduct a job search.
08.02 Secure information about a job.
08.03 Identify documents which may be required when applying for a job interview.
08.04 Complete a job application form correctly.
08.05 Demonstrate competence in job interview techniques.
08.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
08.07 Identify acceptable work habits.
08.08 Demonstrate knowledge of how to make job changes appropriately.
08.09 Demonstrate acceptable employee health habits.

09.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

09.01 Define entrepreneurship.
09.02 Describe the importance of entrepreneurship to the American economy.
09.03 List the advantages and disadvantages of business ownership.
09.04 Identify the risks involved in ownership of a business.
09.05 Identify the necessary personal characteristics of a successful entrepreneur.
09.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Television Production Technology

CODE NUMBER: Secondary ______ Postsecondary RTV0995

Florida CIP IN10.010400

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-15

CERTIFICATION COVERAGE: TEC ELEC @ 7 TV PRO TEC 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as television camera operators (10221802), broadcast technicians (10080808), video recording engineers (194.362-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and preparation to assume responsibility for overall production of television studio activities including scripts, lighting, filming and directing, electronic news gathering, and field production.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in camera principles, audio and video control, lighting methods, control room operation, station operation, and set preparation.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 2160 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate knowledge of the television production technology program instructional system, safety procedures and trade terminology.
02. Plan a set for television production.
03. Perform lighting activities for a planned production.
04. Operate studio color television camera.
05. Perform video tape recording and editing operations.
06. Perform television production and programming activities.
07. Perform character generator and special effects generator functions.

08. Operate television studio audio control system.
09. Perform electronic news gathering (ENG) and electronic field production (EFP) equipment functions.
10. Perform basic film operations.
11. Perform routine operator preventative maintenance operations.
12. Demonstrate employability skills.
13. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________
PROGRAM TITLE: Television Production Technology POSTSECONDARY NUMBER: RTV0995

01.0 DEMONSTRATE KNOWLEDGE OF THE TELEVISION PRODUCTION TECHNOLOGY PROGRAM INSTRUCTIONAL SYSTEM, SAFETY PROCEDURES AND TRADE TERMINOLOGY--The student will be able to:

01.01 Describe the operating system of the vocational program.
01.02 State and apply general safety rules for operation of equipment and learning activities in the lab.
01.03 Utilize trade terminology in the television production lab.
01.04 Utilize trade abbreviations and acronyms as appropriate.
01.05 Transport equipment safety and securely.
01.06 Store equipment in appropriate locations.

02.0 PLAN A SET FOR TELEVISION PRODUCTION--The student will be able to:

02.01 Prepare television set for a planned production.
02.02 Draw and design a set plan to scale.
02.03 Select and arrange stage props.
02.04 Utilize hand tools to construct scene components.
02.05 Inspect and repair scenery as needed.

03.0 PERFORM LIGHTING ACTIVITIES FOR A PLANNED PRODUCTION--The student will be able to:

03.01 Describe types of lighting fixtures.
03.02 Identify parts of lighting fixtures.
03.03 Perform special-effects lighting.
03.04 Set-up appropriate lighting for a production.
03.05 Describe functions of master lighting panel and dimmer board.
03.06 Operate master lighting panel to dimmer board.
03.07 Analyze lighting needs for production.

04.0 OPERATE STUDIO COLOR TELEVISION CAMERA--The student will be able to:

04.01 Describe major parts of a studio camera.
04.02 Align camera for a studio production.
04.03 Perform appropriate camera movements.
04.04 Operate camera for commercial recording.
04.05 Operate camera for studio production.
04.06 Perform floor director's functions.

05.0 PERFORM VIDEO TAPE RECORDING AND EDITING OPERATIONS--The student will be able to:

05.01 Identify and describe different video tape machines.
05.02 Describe operational parts of a video tape machine.
05.03 Operate video tape machine to record and playback.
05.04 Describe operational parts of a video cassette editor.
05.05 Perform assemble edits.
05.06 Perform insert edits.
05.07 Set-up video tape machines.
05.08 Set-up video cassette editor.

06.0 PERFORM TELEVISION PRODUCTION AND PROGRAMMING ACTIVITIES--The student will be able to:

06.01 Operate master switcher.
06.02 Operate routing switcher for production and tape dubs.
06.03 Set-up machines and tuner for in-house playback.
06.04 Compute broadcast math.
06.05 Develop script for a program.
06.06 Draw story board for a planned production.
06.07 Direct participants in production of a program.
06.08 Perform on-camera.

07.0 PERFORM CHARACTER GENERATOR AND SPECIAL EFFECTS GENERATOR FUNCTIONS--The student will be able to:

07.01 Describe operational parts of character generator.
07.02 Set-up character generator.
07.03 Describe inputs of special effects generator.
07.04 Operate special effects generator during production.
07.05 Operate character generator during production.

08.0 OPERATE TELEVISION STUDIO AUDIO CONTROL SYSTEM--The student will be able to:

08.01 Identify and select microphones for production.
08.02 Place microphones for maximum effect.
08.03 Describe parts of cartridge machine.
08.04 Set-up cartridge machine for production.
08.05 Operate cartridge machine during recording and playback.
08.06 Describe parts of reel-to-reel tape machine.
08.07 Set-up reel-to-reel tape and cassette tape machines for production.
08.08 Operate reel-to-reel tape and cassette tape machines for production.
08.09 Describe parts of a turntable.
08.10 Operate turntable for production.
08.11 Describe parts a audio mixing console.
08.12 Operate audio mixing console.

09.0 PERFORM ELECTRONIC NEWS GATHERING (ENG) AND ELECTRONIC FIELD PRODUCTION (EFP) EQUIPMENT FUNCTIONS--The student will be able to:

09.01 Describe ENG and EFP port-a-pac components.
09.02 Set-up port-a-pac for field production.
09.03 Operate port-a-pac during production segments.

10.0 PERFORM BASIC FILM OPERATIONS--The student will be able to:

10.01 Operate film editor.
10.02 Edit film for time slot.
10.03 Describe parts of film island.
10.04 Set-up film island for production.

11.0 PERFORM ROUTINE OPERATOR PREVENTATIVE MAINTENANCE OPERATIONS--The student will be able to:

11.01 Describe types of video connectors.
11.02 Describe types of audio connectors.
11.03 Assemble audio and video cables.
11.04 Operate soldering equipment.
11.05 Clean tape heads on audio recording equipment.
11.06 Clean tape heads on video recording equipment.
11.07 Replace broken knobs.
11.08 Replace sliders and potentiometers.
11.09 Troubleshoot bad cable connection.
11.10 Replace headshell/cartridge and balance tone arm.
11.11 Adjust turntable speed as needed.
11.12 Solder ¼", RCA, miniature, and XLR connectors.
11.13 Strip cable for soldering.
11.14 Replace bulb in light fixture.

12.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents which may be required when applying for a job interview.
12.04 Complete a job application form correctly.
12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.

13.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

13.01 Define entrepreneurship.
13.02 Describe the importance of entrepreneurship to the American economy.
13.03 List the advantages and disadvantages of business ownership.
13.04 Identify the risks involved in ownership of a business.
13.05 Identify the necessary personal characteristics of a successful entrepreneur.
13.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Theater and Entertainment Technology

CODE NUMBER: Secondary ______ Postsecondary TPA0990

Florida CIP IN50.999901

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS _____ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-15

CERTIFICATION COVERAGE: ANY IND EDUCATION LEVEL 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as sound controllers (194.262-014), theater technicians, grips (962.684-014) and (962.687-022), dressers (346.674-010), prop makers (962.281-010), lighting equipment operators (962.381-014), high riggers (962.664-010), lighting technicians (962.362-014), stage hands (962.167-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, training in stage craft, theatrical lighting and sound, and equipment maintenance.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in stage lighting, sound, scenery construction, equipment maintenance and theatrical performance.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1620 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Construct and install theatrical scenery to the specifications required in a scene design.
02. Perform the duties of a stage hand.
03. Install and operate theatrical sound equipment for performance.
04. Execute a "sound score" for theatrical productions.
05. Hang, focus and circuit stage lights to the specifications required in lighting designs.

06. Perform the duties of a light board operator and follow spot operator.
07. Maintain theater lighting and sound equipment.
08. Function as part of a technical team in planning, implementing, and running the technical aspects of theatrical/entertainment procedures.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS

PROGRAM AREA: Industrial

PROGRAM TITLE: Theater and Entertainment Technology

EFFECTIVE DATE: July, 1987

SECONDARY NUMBER: ________

POSTSECONDARY NUMBER: TPA0990

01.0 CONSTRUCT AND INSTALL THEATRICAL SCENERY TO THE SPECIFICATIONS REQUIRED IN A SCENE DESIGN--The student will be able to:

01.01 Use hand and power tools commonly found in theater scene shops.
01.02 Draft working drawings when given a ground plan and designer's elevations.
01.03 Choose the appropriate materials and hardware for scenic construction.
01.04 Construct common flat scenery used for theatrical purposes.
01.05 Construct common three-dimensional scenery used for theatrical purposes.
01.06 Demonstrate application techniques used in painting scenery.
01.07 Construct special effects commonly used in the theater.

02.0 PERFORM THE DUTIES OF A STAGE HAND--The student will be able to:

02.01 Operate equipment commonly found in theaters.
02.02 Determine methods for scenery repair within a limited time frame.
02.03 Assume crew chief responsibilities.
02.04 Perform all duties in a disciplined manner as required by the demands of performance.

03.0 INSTALL AND OPERATE THEATRICAL SOUND EQUIPMENT FOR PERFORMANCE--The student will be able to:

03.01 Identify sound equipment used in theatrical productions.
03.02 Assemble various components to develop a system.
03.03 Install a sound system resulting in optimal performance and safety of the equipment.
03.04 Operate sound equipment in record and playback mode.

04.0 EXECUTE A "SOUND SCORE" FOR THEATRICAL PRODUCTIONS--The student will be able to:

04.01 Select sound material.
04.02 Prepare, by recording and editing a sound tape for theatrical productions.
04.03 Operate components of sound systems as required for both reinforcement and effects applications.
04.04 Construct and operate mechanical electrical sound effects for productions.
04.05 Execute sound cues in performance.

05.0 HANG, FOCUS AND CIRCUIT STAGE LIGHTS TO THE SPECIFICATIONS REQUIRED IN LIGHTING DESIGNS--The student will be able to:

05.01 Read a standard lighting plot.
05.02 Read a standard instrument schedule.
05.03 Identify stage lighting equipment.
05.04 Hang and circuit lights for a stage production.
05.05 Focus lights for a stage production.

06.0 PERFORM THE DUTIES OF A LIGHT BOARD OPERATOR AND FOLLOW SPOT OPERATOR--The student will be able to:

06.01 Make and read a lighting cue sheet.
06.02 Execute cues on a pre-set lighting board.
06.03 Program and execute cues on a memory lighting board.
06.04 Execute cues on a follow spot.

07.0 MAINTAIN THEATER LIGHTING AND SOUND EQUIPMENT--The student will be able to:

07.01 Calibrate and operate test equipment through all modes of operation as necessary for the maintenance of theater lighting and sound equipment.
07.02 Locate malfunctions in theater sound and lighting equipment using applicable diagnostic methods.
07.03 Read and understand technical manuals for theater lighting and sound equipment.

07.04 Update documentation so as to be aware of changes in manufacturer's product.
07.05 Record service records on equipment for the purpose of documenting manufacturer's warranties and maintaining a parts inventory.
07.06 Relate information about manufacturers and suppliers of theater lighting and sound equipment and supplies.

08.0 FUNCTION AS PART OF A TECHNICAL TEAM IN PLANNING, IMPLEMENTING AND RUNNING THE TECHNICAL ASPECTS OF THEATRICAL/ENTERTAINMENT PRODUCTIONS--The student will be able to:

08.01 Perform as a member of a technical team within the framework of an organized theater production.
08.02 Schedule job assignments in order to meet production deadlines.
08.03 Apply accepted principles of theater technology to a production situation(s).
08.04 Adapt learned skills and generate new approaches in order to solve unique production problems.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Tile Setting

CODE NUMBER: Secondary ______ Postsecondary BCT0450

Florida CIP IN46.010300

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-17

CERTIFICATION COVERAGE: TEC CONSTR @ 7 BLDG CONST @ 7 TILE SET 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as tile setters (50024001), or to provide supplemental training for persons previously or currently employed in this occupation.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, proper care and use of hand tools and equipment, tile setting materials, basic blueprint reading, trade math and estimating materials for tile setting.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in adhesives, bedding materials, clay wall applications, masonry bed application, layout, setting, cutting, and grouting of ceramic tile.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 500 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Prepare walls for drywall application of ceramic tile.
02. Prepare walls using wire lathe, scratch coat and screeded coat for wet wall application of ceramic tile.
03. Apply tile and grout utilizing drywall techniques.
04. Apply tile and grout utilizing wet wall techniques.
05. Layout, cut and install ceramic tile on walls and floors, plumb, level, and with straight joints.
06. Interpret blueprints and estimate materials for tile work.
07. Proportion and mix mortar for tile installation.
08. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS

TILE SETTING

01.0 PREPARE WALLS FOR DRYWALL APPLICATION OF CERAMIC TILE — The student will be able to:

01.01 Determine readiness of subsurface for tile installation.
01.02 Repair damaged drywall.
01.03 Sand and finish drywall for application of tile.

02.0 PREPARE WALLS USING WIRE LATH, SCRATCH COAT AND SCREEDED COAT FOR WET WALL APPLICATION OF CERAMIC TILE — The student will be able to:

02.01 Install screed mud over concrete slab to install shower floor.
02.02 Measure and cut metal lath to size for walls and ceilings with tin snips.
02.03 Tack lath to wall and ceiling surfaces with staple gun or hammer.
02.04 Spread plaster base over lath with trowel and level plaster to specified thickness, using screed.
02.05 Spread concrete on subfloor with trowel and level it with screed.
02.06 Remove and replace existing backing materials in wet area.

03.0 APPLY TILE AND GROUT UTILIZING DRYWALL TECHNIQUES — The student will be able to:

03.01 Set tile on drywall with thinset.
03.02 Set tile using mastic adhesives.
03.03 Position tile and tap it with trowel handle to affix tile to plaster or adhesive.
03.04 Install tile over wire mesh and concrete masonry units.
03.05 Install tile over wood counter top.
03.06 Install counter top backsplash.
03.07 Layout counter top and backsplash designs.
03.08 Grout counter top and backsplash.
03.09 Grout floor tile.

04.0 APPLY TILE AND GROUT UTILIZING WET WALL TECHNIQUES — The student will be able to:

04.01 Grout tile on walls and floors.
04.02 Install tile floor over concrete slab using thinset.
04.03 Replace grout.
04.04 Grout wet area installation.
04.05 Install tile in shower stall.
04.06 Lay out shower.
04.07 Build a shower curb.
04.08 Prepare shower floor for tile installation.
04.09 Install wire mesh mortar units in a shower.
04.10 Install wire mesh mortar units in a tub surround.

05.0 LAYOUT, CUT, AND INSTALL CERAMIC TILE ON WALLS AND FLOORS, PLUMB, LEVEL, AND WITH STRAIGHT JOINTS — The student will be able to:

05.01 Select and use tile setting tools.
05.02 Use tile nippers to nip different types of tile.
05.03 Cut and shape tile with tile cutters and biters.
05.04 Cut different types of tile with tile hand cutters.
05.05 Cut tile with rod saw.
05.06 Use a level.
05.07 Use electric drill.
05.08 Use tile saw.
05.09 Use tile cutter.
05.10 Cut tile with electric saw.
05.11 Clean tools and maintain in working order.
05.12 Smooth cut tile edges with grinding stone.
05.13 Select and use measurement tools.
05.14 Install tile plumb and level using level.
05.15 Square tile layouts using a steel square.
05.16 Maintain true and correct tile work with square.
05.17 Maintain clean, neat, and safe work area.
05.18 Practice personal and general job safety procedures of tile setters.
05.19 Miter base tile to fit angles.
05.20 Miter cap tile to fit angles.
05.21 Draw level starting and field lines, and level curbs and door jambs using a level.
05.22 Lay down working, finish, plumb, and level lines using a chalk line.
05.23 Butt tile rows using straightedge on starting line.
05.24 Figure layout.
05.25 Measure, cut, and install metal lath for shower pan.

05.26 Chisel tile and setting related substances.
05.27 Lay out tile setting jobs.
05.28 Lay out floor.
05.29 Install tile over previously poured interior concrete floor.
05.30 Install tile over wood floor.
05.31 Install ceramic tile over existing floor covering.
05.32 Install tile over existing tile.
05.33 Install tile floor over wood floor using mastic adhesive.
05.34 Install floor tile over wire mesh mortar units.
05.35 Install tile on exterior floor.
05.36 Install ceramic tile over ceramic tile on tub surround.
05.37 Install ceramic tile over laminated counter top and backsplash.
05.38 Install marble window sills.
05.39 Install tile window sills.
05.40 Install a complete shower floor.
05.41 Clean aged tile.
05.42 Replace loose or damaged tile.
05.43 Measure and cut marble window sills.
05.44 Remove and replace shower floor and base.
05.45 Install fixtures.

06.0 INTERPRET BLUEPRINTS AND ESTIMATE MATERIALS FOR TILE WORK — The student will be able to:

06.01 Apply basic math skills to tile setting.
06.02 Measure floors, and walls using steel measuring tapes.
06.03 Measure tile cuts using wood folding rule.
06.04 Figure total tile amounts needed for job.
06.05 Estimate how many square feet of tile needed for bathroom walls.
06.06 Estimate how many square feet of tile needed for floor areas.
06.07 Calculate costs.
06.08 Maintain records of materials used.
06.09 Read blueprints and specification sheets that apply to tile setting.
06.10 Examine blueprints, measure and mark surfaces to be covered and lay out work.
06.11 Prepare list of supplies and tools needed to complete a job.

07.0 PROPORTION AND MIX MORTAR FOR TILE INSTALLATION — The student will be able to:

07.01 Mix setting materials manually with hand tools and equipment.
07.02 Mix setting materials with a power mixer.
07.03 Follow safety practices when mixing setting materials.
07.04 Follow manufacturers directions.
07.05 Select and mix adhesives to set tile.
07.06 Determine quantity and type of setting materials needed.
07.07 Proportion setting materials ingredients for specific uses.

08.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS — The student will be able to:

08.01 List sources of job openings other than public or private employment agencies.
08.02 Write a letter of application for a job.
08.03 Prepare a vita, resume or personal fact sheet.
08.04 List factors to consider when applying for a job.
08.05 List ways of making contact with employers.
08.06 Identify documents which may be required when applying for a job interview.
08.07 Complete a job application form correctly.
08.08 Identify appropriate dress and grooming for a job interview.
08.09 Classify behaviors considered appropriate or inappropriate in a job interview situation.
08.10 Describe advantage to employer and employees of being a productive worker.
08.11 Explain the purpose of supervision, self discipline and performance evaluation.
08.12 Identify appropriate response(s) to criticism from employer, supervisor, or other employees.
08.13 List consequences of being absent frequently from the job.
08.14 List consequences of frequently arriving late for work.
08.15 List factors to consider when resigning from a job.
08.16 Write a letter of resignation.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial
FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987
PROGRAM TITLE: Tool and Die Making
CODE NUMBER: Secondary ______ Postsecondary MTR0440
Florida CIP IN48.050700

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 ____9-12 ____Postsecondary Adult Vocational
______ Postsecondary Vocational x Other 13-17

CERTIFICATION COVERAGE: MACH SHOP 7 TOOL DIE @ 7
METAL WORK @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as tool and die makers (50063001), jig and fixture makers (601.281-026), mold makers (681.280-030), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, analyzing specifications, laying out metal stock, setting up and operating machine tools to fit, and assembling parts for the manufacture and repair of metalworking dies, cutting tools, fixtures, gauges, and machinists' hand tools.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in milling, electro discharge machines (E.D.M.), high speed stamping technology, die grinding, modification and repair, and die finishing.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

A student admitted to this program must have completed a recognized machine shop program or demonstrate equivalent skill competencies in precision machining and math through industrial shop experiences.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 400 hours in addition to completing Precision Machining (IN48.050300).

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply shop and safety skills.
02. Apply shop math.
03. Identify tool steels.
04. Perform production operations.
05. Band-saw tool steels.
06. Perform basic die designs.

07. Perform progressive die designs.
08. Demonstrate knowledge of feed systems.
09. Perform milling operations.
10. Operate electro discharge machines.
11. Demonstrate application of high speed stamping technology.
12. Perform die grinding, modification and repairs.
13. Perform form grinding.
14. Operate jig borers.
15. Operate jig grinders.
16. Demonstrate proficiency in cutter grinding.
17. Perform die finishing operations.
18. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS

TOOL AND DIE MAKING

01.0 APPLY SHOP AND SAFETY SKILLS — The student will be able to:

01.01 Supervise maintenance of shop safety equipment.

02.0 APPLY SHOP MATH — The student will be able to:

02.01 Measure workpiece using inside caliper.
02.02 Calculate amount of material to be removed to obtain correct limits for rework.
02.03 Calculate conversion of revolution per minute (RPM) to surface feet per minute (SFPM).
02.04 Calculate dimensions of keyseats.
02.05 Calculate tolerances.
02.06 Calculate stock utilization.
02.07 Calculate machine RPM for a given material size.
02.08 Calculate gear blank specifications for indexing.
02.09 Convert to metric measurement.
02.10 Determine clearance, relief, and rake of cutting tools.
02.11 Determine material tensile strength.
02.12 Take micrometer readings to determine shaft diameter.

03.0 IDENTIFY TOOL STEELS — The student will be able to:

03.01 Identify the properties of tools steels.
03.02 Explain the application of tool steels.

04.0 PERFORM PRODUCTION OPERATIONS — The student will be able to:

04.01 Cut alloyed steel.
04.02 Mill alloyed steel.
04.03 Turn tool steels.
04.04 Thread tool steels.

05.0 BAND-SAW TOOL STEELS — The student will be able to:

05.01 Saw scribed lines.
05.02 Saw internal contours.

06.0 PERFORM BASIC DIE DESIGN — The student will be able to:

06.01 Make button die.
06.02 Make rectangular die.
06.03 Calculate stamping force tonnage.
06.04 Strip loads.
06.05 Produce die relief.

07.0 PERFORM PROGRESSIVE DIE DESIGNS — The student will be able to:

07.01 Design simple two-stage die hand strip feed.
07.02 "Back off" die.
07.03 Stage progressive die.
07.04 Form dies.
07.05 Draw dies.
07.06 Emboss dies.
07.07 Coin dies.
07.08 Stake dies.
07.09 Lance dies.

08.0 DEMONSTRATE KNOWLEDGE OF FEED SYSTEMS — The student will be able to:

08.01 Identify properties of hitch feed.
08.02 Identify properities of air feed.
08.03 Identify properities of roll feed.
08.04 Identify properties of transfer.

09.0 PERFORM MILLING OPERATIONS — The student will be able to:

09.01 Align milling machine fixtures.
09.02 Align milling machine attachments.
09.03 Assemble mill work.
09.04 Bore holes with milling machines.

09.05 Bore for a finish bushing fit.
09.06 Bore to remove bushings.
09.07 Cut external keyway.
09.08 Drill holes with milling machine.
09.09 Inspect completed millwork.
09.10 Mill an angle.
09.11 Mill an external radius.
09.12 Mill cylindrical workpiece.
09.13 Mill spur gears.
09.14 Mill internal slots using slotter and attachments.
09.15 Perform end milling.
09.16 Perform flycut.
09.17 Perform index.
09.18 Perform reaming operations.
09.19 Perform cutting-off operation.
09.20 Perform straddle milling operations on the horizontal mill.
09.21 Set speeds and feeds for milling work.
09.22 Square workpiece using dividinghead.
09.23 Square up metal using table vise.

10.0 OPERATE ELECTRODISCHARGE MACHINE — The student will be able to:

10.01 Drill workpiece with electrodischarge machine (EDM).
10.02 List and identify the function and nomenclature of the machine.
10.03 Identify and select proper machine controls.
10.04 Select proper work-holding devices.
10.05 Select and use proper power supply settings.
10.06 Select and use proper electrode size for the operation to be performed.
10.07 Calculate the proper electrode size for the operation to the performed.
10.08 Burn a design in a part to blueprint tolerances.

11.0 DEMONSTRATE APPLICATION OF HIGH-SPEED STAMPING TECHNOLOGY — The student will be able to:

11.01 Use high-speed presses.
11.02 Use high speed feeder.
11.03 Set speed of feeder to material.
11.04 Strip lubrication.

12.0 PERFORM DIE GRINDING MODIFICATION AND REPAIRS — The student will be able to:

12.01 Perform die regrind, die service.
12.02 Perform die modification.
12.03 Perform die repair.

13.0 PERFORM FORM GRINDING — The student will be able to:

13.01 Select appropriate grinding attachments.
13.02 Crush form the grinding wheel.
13.03 Operate the Harig type spindex.

14.0 OPERATE JIG BORERS — The student will be able to:

14.01 Select appropriate work holding device.
14.02 Use jig borer in boring and tooling operations.
14.03 Use jig borer in determing hole coordinates.
14.04 Use jig borer in hole sizing operations.

15.0 OPERATE JIG GRINDERS — The student will be able to:

15.01 Select appropriate work holding device.
15.02 Demonstrate hi-speed safety procedures.
15.03 Use jig grinder in determing hole coordinates.
15.04 Use jig grinder in hole sizing operations.
15.05 Use jig grinder in determining measurements.
15.06 Use jig grinder in various grinding methods.
15.07 Use jig grinder on micro wheels.
15.08 Use jig grinder on micro burrs.

16.0 DEMONSTRATE PROFICIENCY IN CUTTER GRINDING — The student will be able to:

16.01 Utilize special radius and forms mills.
16.02 Utilize lathe bits.
16.03 Utilize formed fly cutter blanks.

17.0 PERFORM DIE FINISHING OPERATIONS — The student will be able to:

17.01 Stone and polish dies to required finish with abrasive and diamond graded medium to mirror finish.

18.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS — The student will be able to:

18.01 List sources of job opening other than public or private employment agencies.
18.02 Write a letter of application for a job.
18.03 Prepare a vita, resume or personal fact sheet.
18.04 List factors to consider when applying for a job.
18.05 List ways of making contact with employers.
18.06 Identify documents which may be required when applying for a job interview.
18.07 Complete a job application form correctly.
18.08 Identify appropriate dress and grooming for a job interview.
18.09 Classify behaviors considered appropriate or inappropriate in a job interview situation.
18.10 Describe advantage to employerr and employees of being a productive worker.
18.11 Explain the purpose of supervision, self discipline and performance evaluation.
18.12 Identify appropriate response(s) to criticism from employer, supervisor or other employees.
18.13 List consequences of being absent frequently from the job.
18.14 List consequences of frequently arriving late for work.
18.15 List factors to consider when resigning from a job.
18.16 Write a letter of resignation.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Tractor and Trailer Body Repair and Refinishing

CODE NUMBER: Secondary _______ Postsecondary ARR0995

Florida CIP IN47.060301

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-17

CERTIFICATION COVERAGE: BODY FEND 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as truck body builders (807.281-010), transportation equipment painters (845.381-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the repair of bodies, fenders, and chassis of tractors and trailers.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in welding, sheetmetal work, plastic and fiberglass repair, painting, detailing, and frame straightening and repair on tractors and trailers.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1600 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate understanding of shop procedures.
02. Demonstrate use, care and maintenance of hand tools and power tools.
03. Align frames and suspension components.
04. Perform sheetmetal, wood, and aluminum frame, body, and chassis repairs on trailers.
05. Replace and repair fiberglass and plastic body components.
06. Replace window glass.
07. Rebuild and prime body panels.
08. Apply finish coats to prepared panels.
09. Demonstrate welding skills.
10. Perform detail work.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial Education — SECONDARY NUMBER: ______
PROGRAM TITLE: Tractor and Trailer Body Repair and Refinishing — POSTSECONDARY NUMBER: ARR0995

01.0 DEMONSTRATE UNDERSTANDING OF SHOP PROCEDURES--The student will be able to:

01.01 Apply school and shop policies and procedures.
01.02 Apply shop safety rules and procedures.
01.03 Apply personal safety rules and procedures.
01.04 Apply electrical safety rules and procedures.
01.05 Apply fire safety rules and procedures.

02.0 DEMONSTRATE USE, CARE, AND MAINTENANCE OF HAND TOOLS AND POWER TOOLS--The student will be able to:

02.01 Identify, use, and show proper care and maintenance for the various hand tools employed by a body repair and refinishing technician.
02.02 Identify, use, and show proper care and maintenance for the various power tools employed by a body repair and refinishing technician.
02.03 Identify, use, and show proper care and maintenance for the various shop equipment employed by a body repair and refinishing technician.

03.0 ALIGN FRAMES AND SUSPENSION COMPONENTS--The student will be able to:

03.01 Diagnose and measure frame damage using self-centering, tram, and datum line gauges.
03.02 Straighten and align mash, sag, sidesway, twist, kickup, broadside, and diamond frame damage.
03.03 Remove and replace damaged frame horns, side rails, cross members, front or rear frame sections; weld cracks in frame members.
03.04 Clean, prime, and protective-coat repaired frame areas.
03.05 Repair, reinforce, or replace weakened frame members in accordance with manufacturers' recommendations.

04.0 PERFORM SHEETMETAL,WOOD, AND ALUMINUM FRAME, BODY, AND CHASSIS REPAIRS ON TRAILERS--The student will be able to:

04.01 Remove and replace a bolted panel on panel assembly.
04.02 Remove and replace a welded sheetmetal panel or panel assembly.
04.03 Remove folds, curves, creases, and dents using power tools and hand tools to restore damaged areas to proper contours and dimensions.
04.04 Weld cracked or torn sheet steel body panels. Reweld broken welds.
04.05 Weld cracked or torn aluminum body panels. Reweld broken welds.
04.06 Cut out damaged sections of sheet steel body panels and weld in replacements.
04.07 Cut out damaged sections of aluminum body panels and weld in replacements.
04.08 Heat shrink stretched panel areas back to contour.
04.09 Cold shrink stretched panel areas back to contour.
04.10 Recheck panel contour and alignment after shaping and correct or adjust as necessary.
04.11 Braze body panels only in locations recommended by manufacturer.
04.12 Straighten roughed-out contours of damaged panel to a surface condition for bodyfilling or metal finishing.

05.0 REPLACE AND REPAIR FIBERGLASS AND PLASTIC BODY COMPONENTS--The student will be able to:

05.01 Repair deep gauges and cracks in fiberglass panels.
05.02 Repair holes in fiberglass panels.
05.03 Replace fiberglass body panels and straighten or align panel supports.
05.04 Remove damaged areas from fiberglass panels. Repair with partial panel installation.
05.05 Identify the type of plastic to be repaired and the appropriate repair procedure (including hot air welding, chemical bonding, and the use of structural adhesives).
05.06 Prepare the surface of thermoplastic parts and repair damage.
05.07 Prepare the surface of thermosetting plastic parts and repair damage.

06.0 REPLACE WINDOW GLASS--The student will be able to:

06.01 Inspect, adjust, repair, or replace window regulators, run channels, glass, power mechanisms, and related controls.
06.02 Diagnose and repair water leaks, dust leaks, and wind noises.
06.03 Inspect, repair, and replace weatherstripping.
06.04 Inspect, remove, and replace all stationary glass (including windshields, backlights, etc.), using manufacturers' recommended installation materials and procedures.

07.0 REBUILD AND PRIME BODY PANELS--The student will be able to:

07.01 Determine the extent of the direct and indirect damage, the direction of impact, and plan the methods and order of repair.
07.02 Straighten and align cowl assembly.
07.03 Straighten and align roof pillars and roof panels.
07.04 Straighten and align door posts.
07.05 Straighten and align door sills, floor pan, and rocker panels.
07.06 Straighten and align quarter panels, wheel house assemblies, and rear body sections.
07.07 Remove and replace hood, hood hinges, and hood latch.
07.08 Remove and replace doors and hinges.
07.09 Remove and replace bumpers, reinforcements, guards, isolators, and mounting hardware.
07.10 Check and adjust hood clearances to adjoining panels.
07.11 Check door hinge condition; check door frames for square;check and adjust door clearances (where adjustable) along quarter panel, door, rocker panel, fender, and top.
07.12 Check and adjust bumper clearances to adjacent body and filler.
07.13 Repair or replace door skins and intrusion beams.
07.14 Restore protective coatings and sealants.
07.15 Grind the paint from the damaged area of a body panel to eliminate surface irregularities.
07.16 Pick and file the damaged area of a body panel to eliminate surface irregularities
07.17 Disc sand the repaired body panel to produce final smoothness.
07.18 Mix plastic filler.
07.19 Apply plastic body filler and cheese grate during curing.
07.20 Round sand cured plastic body panel for solder filling.
07.21 Clean and file surface of body panel for solder filling.
07.22 Apply and paddle body solder.
07.23 Grind and file body solder to contour and finish sand.
07.24 Neutralize the thinning agent acid.

08.0 APPLY FINISH COATS TO PREPARED PANELS--The student will be able to:

08.01 Use primers and sealers.
08.02 Clean surface for refinishing.
08.03 Sand painted surfaces.
08.04 Perform masking techniques.
08.05 Mix and tint paint.
08.06 Strip damaged finish.
08.07 Detail and touch up finished job.
08.08 Apply acrylic lacquer top coat.
08.09 Apply acrylic enamel top coat.
08.10 Apply polyurethane top coat.
08.11 Apply alkyd enamel top coat.
08.12 Apply stripes and decals.
08.13 Perform spot paint repair.

09.0 DEMONSTRATE WELDING SKILLS--The student will be able to:

09.01 Perform oxyacetylene cutting and welding.
09.02 Set up oxyacetylene station.
09.03 Light and adjust cutting torch.
09.04 Lay out and burn straight cuts in sheer metal.
09.05 Light and adjust welding torch.
09.06 Carry puddle without filler rod on mild steel (flat position).
09.07 Carry puddle with filler rod (flat position).
09.08 Carry puddle with filler rod on aluminum (flat position).
09.09 Construct a butt joint weld (flat position).
09.10 Construct a lap joint weld (flat position).
09.11 Construct a butt joint weld (horizontal position).
09.12 Construct a lap joint weld (horizontal position).
09.13 Construct a butt joint weld (vertical position).

09.14 Construct a lap joint weld (vertical position).
09.15 Construct a butt joint weld (overhead position).
09.16 Construct a lap joint weld (overhead position).
09.17 Braze a lap joint weld (horizontal position).
09.18 Perform shielded metal arc welding.
09.19 Set up and adjust shielded metal arc welding station.
09.20 Weld station bead pattern (flat position).
09.21 Construct a butt joint weld (flat position).
09.22 Construct a lap joint weld (flat position).
09.23 Butt weld channel iron (flat position).
09.24 Perform gas metal arc welding.
09.25 Set up and adjust gas metal arc welding station.
09.26 Weld straight bead pattern on mild steel (flat position).
09.27 Weld straight bead pattern on aluminum (flat position).
09.28 Weld straight bead pattern on high strength steel (flat position).
09.29 Construct a butt joint weld (flat position).
09.30 Construct a lap joint weld (flat position).
09.31 Construct a butt joint weld (horizontal position).
09.32 Construct a lap joint weld (horizontal position).
09.33 Construct a butt joint weld (vertical position).
09.34 Construct a lap joint weld (vertical position).
09.35 Construct a butt joint weld (overhead position).
09.36 Construct a lap joint weld (overhead position).

10.0 PERFORM DETAIL WORK--The student will be able to:

10.01 Perform cleaning and restoring of interior areas.
10.02 Perform cleaning and restoring of exterior areas.
10.03 Perform cleaning and restoring of engine compartment.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Trade and Industrial Supervision and Management Technology

CODE NUMBER: Secondary ______ Postsecondary BCT0810

Florida CIP IN06.200100

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-15

CERTIFICATION COVERAGE: SUPVR TRG 7 IND ENGR 7
HUMAN REL @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as all other managers and officials (20061699), superintendents (183.117-014), supervisors (550.132-010), foreman coordinators (221.162-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, principles of management, planning and cost control, acquisition and retention of manpower, production processes, and quality control and reliability standards.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in those areas that are directly related to the occupational area for which the training is being offered.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 9.0, Language 9.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1620 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply supervision skills.
02. Communicate effectively in supervision.
03. Manage human behavior.
04. Motivate one's self.
05. Motivate others.
06. Apply strategies for effective management.
07. Utilize creative thinking to achieve business objectives.
08. Apply basic decision making skills in supervision.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Trade and Industrial Supervision and Management Technology POSTSECONDARY NUMBER: BCT0810

01.0 APPLY SUPERVISION SKILLS--The student will be able to:

01.01 Specify the responsibilities of the supervisor.
01.02 Practice human relations skills.
01.03 Follow leadership principles and approaches.
01.04 Apply positive approaches to discipline.
01.05 Conceptualize organizational functions of management.
01.06 Develop organizational plans.
01.07 Follow and teach accepted accident prevention practices.
01.08 Apply elements of delegation.
01.09 Coordinate employee and organization interest.
01.10 Apply techniques of dealing with crisis.
01.11 Utilize strategies for dealing with interpersonal conflicts.
01.12 Analyze causes of resistance in employees.
01.13 Implement the agreement finding process.
01.14 Develop and implement job instructions.
01.15 Apply delegation procedures.

02.0 COMMUNICATE EFFECTIVELY IN SUPERVISION--The student will be able to:

02.01 Solve problems in communicating.
02.02 Exhibit appropriate habits in person to person communication.
02.03 Apply listening skills.
02.04 Use communication feedback effectively.
02.05 Use persuasion skills in communicating.
02.06 Build credibility in management.
02.07 React to non-verbal communication.
02.08 Practice confrontation skills.

03.0 MANAGE HUMAN BEHAVIOR--The student will be able to:

03.01 Use behavior modification techniques.
03.02 Practice transactional analysis skills.
03.03 Establish goals and objectives.
03.04 Identify and resolve emotional disturbances of workers.
03.05 Use self concept building skills.
03.06 Assess worker and supervisor roles and relationships.
03.07 Manage worker resistance to change.
03.08 Diagnose the dynamics involved in performance appraisal.
03.09 Use appropriate assertiveness skills.

04.0 MOTIVATE ONE'S SELF--The student will be able to:

04.01 Build improved attitude and self-confidence.
04.02 Conceptualize cause and effect relationship.
04.03 Set personal goals.
04.04 Apply self-esteem building skills.
04.05 Diagnose life traps.
04.06 Apply self-discipline techniques.
04.07 Determine areas of personal talent.

05.0 MOTIVATE OTHERS--The student will be able to:

05.01 Conceptualize the self-fulling prophesy.
05.02 Conceptualize the process of motivation.
05.03 Apply the hierachy of human needs to worker motivation.
05.04 Effect job enrichment procedures.
05.05 Apply attitude enrichment procedures.
05.06 Conceptualize concept of maintainers and motivators.
05.07 Develop role of trust and credibility in worker motivation.
05.08 Direct goal-setting procedures with workers.
05.09 Implement participative style of supervision.

06.0 APPLY STRATEGIES FOR EFFECTIVE MANAGEMENT--The student will be able to:

06.01 Diagnose unacceptable performance.
06.02 Determine effective discipline procedures.
06.03 Undertake disciplinary action.
06.04 Plan appraisal interviews.
06.05 Conduct appraisal interviews.

06.06 Implement transfer, demotion and termination procedures.
06.07 Conduct hiring interviews.
06.08 Implement recruitment procedures.

07.0 UTILIZE CREATIVE THINKING TO ACHIEVE BUSINESS OBJECTIVES--The student will be able to:

07.01 Conduct and apply techniques for maximum production of ideas.
07.02 Maintain conditions necessary for creative problem solving.
07.03 Diagnose conditions antithetical to creativity.
07.04 Oversee problem solving.

08.0 APPLY BASIC DECISION MAKING SKILLS IN SUPERVISION--The student will be able to:

08.01 Conduct decision making meetings.
08.02 Employ steps of effective decision making.
08.03 Maintain conditions for effective decision making.
08.04 Set goals and objectives.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Upholstery

CODE NUMBER: Secondary ______ Postsecondary UPH0150

Florida CIP IN48.030300

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ______7-9 ______9-12 ______Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-17

CERTIFICATION COVERAGE: FURN REPR 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as furniture upholsterers (50144601), upholstery shop helpers (780.687-054), upholstery installers (915.687-010), sewing machine operators (780.682-010), fabric layout and cutters (781.384-010), cushion construction or upholsterers (780.684-042), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills; leadership skills; human relations and employability skills; safe and efficient work practices; installation, repair, arrangement, and securing springs, filler, padding, and covering material and cutting, sewing and trimming upholstered items.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the use of power sewing machines, cushion stuffers, foam cutters, foam grinders, spray guns, band saws, belt sanders, drills and drill presses, portable power hand tools, air staple guns and hand tools.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Use trade skills.
02. Maintain and operate power machines.
03. Use upholstery skills.
04. Perform management skills.
05. Make and use patterns.
06. Build foundations.
07. Construct cushions.
08. Touch-up wood finish.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1987
PROGRAM AREA: Industrial — SECONDARY NUMBER: ________
PROGRAM TITLE: Upholstery — POSTSECONDARY NUMBER: UPH0150

01.0 USE TRADE SKILLS--The student will be able to:

01.01 Identify furniture styles.
01.02 Use upholstery terminology.
01.03 Use upholstery tools.
01.04 Maintain the shop.
01.05 Clean shop.
01.06 Use appropriate fabric and thread.
01.07 Estimate fabric needed for final cover.
01.08 Mark pattern on fabric.
01.09 Cut out marked fabric

02.0 MAINTAIN AND OPERATE POWER MACHINES--The student will be able to:

02.01 Operate and maintain domestic sewing machines.
02.02 Operate and maintain straight needle machines.
02.03 Operate and maintain walking foot machines.
02.04 Operate and maintain foam grinder.
02.05 Operate and maintain cushion stuffers.
02.06 Operate and maintain steam machines.

03.0 USE UPHOLSTERY SKILLS--The student will be able to:

03.01 Strip furniture down to frame.
03.02 Repair frame.
03.03 Construct decorative items.
03.04 Reconstruct deck with coil springs.
03.05 Reconstruct deck with zig-zag springs.
03.06 Reconstruct deck with rubber webbing.
03.07 Cover inside arms and/or wings.
03.08 Construct standard back.
03.09 Construct a loose pillow back.
03.10 Construct a barrel back.
03.11 Construct a mock diamond-tufted back.
03.12 Construct a diamond-tufted back.
03.13 Construct an attached pillow/bag back
03.14 Construct a channel back.
03.15 Cover outside arms and/or wings.
03.16 Cover outside back.
03.17 Construct a ruffled skirt.
03.18 Construct a pleated skirt.
03.19 Construct a lined-tailored skirt.
03.20 Attach cambric.

04.0 PERFORM MANAGEMENT SKILLS--The student will be able to:

04.01 Estimate cost and completion time.
04.02 Complete a work order.
04.03 Perform shop foreman duties.
04.04 Take inventory.

05.0 MAKE AND USE PATTERNS--The student will be able to:

05.01 Estimate fabric needed for final cover.
05.02 Mark pattern on fabric.
05.03 Cut out marked fabric.

06.0 BUILD FOUNDATIONS--The student will be able to:

06.01 Strip furniture to frame.
06.02 Repair frame.
06.03 Construct decorative items.
06.04 Repair/refinish exposed wood surfaces.
06.05 Respring a sofa.
06.06 Respring a chair.

07.0 CONSTRUCT CUSHIONS--The student will be able to:

07.01 Construct a box cushion cover.
07.02 Construct a "T" cushion cover.
07.03 Construct a knife edge cushion cover.

07.04 Construct a pleated cushion cover.
07.05 Construct a cushion cover with inside springs.
07.06 Construct an attached cushion seat cover.

08.0 TOUCH UP WOOD FINISH--The student will be able to:

08.01 Repair scratches in wood finish.
08.02 Repair holes in wood finish.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Vending and Recreational Machine Repair

CODE NUMBER: Secondary ______ Postsecondary EER0370

Florida CIP IN47.010900

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational __x__ Other 13-17

CERTIFICATION COVERAGE: ELECTRONIC 7 APPLI REPR @ 7

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to prepare students for employment as coin machine servicers, repairers (50083215), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, machine assembly, installation service and repair of vending and recreational machines.

II. **LABORATORY ACTIVITIES**: Shop or laboratory activities are an integral part of this program and provide instruction in troubleshooting defective equipment, basic plumbing, refrigeration, electrical/electronics, machine refinishing, moving and set-up, sanitation, and recordkeeping.

III. **SPECIAL NOTE**: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1200 hours.

IV. **INTENDED OUTCOMES**: After successfully completing this program, the student will be able to:

01. Select and use tools and equipment.
02. Read and interpret blueprints and schematics.
03. Perform basic soldering.
04. Move and set up vending machines.
05. Load and operate machines.
06. Troubleshoot and repair coin mechanisms.
07. Perform minor maintenance and repair of machines.
08. Demonstrate appropriate sanitation practices.
09. Perform basic electrical/electronic repairs.
10. Perform piping and plumbing repairs.

11. Perform refrigeration system repairs.
12. Perform major machine maintenance.
13. Repair and refinish metal.
14. Maintain records and meet sanitation standards.
15. Demonstrate employability skills.

STUDENT PERFORMANCE STANDARDS

VENDING AND RECREATIONAL MACHINE REPAIR

01.0 SELECT AND USE TOOLS AND EQUIPMENT — The student will be able to:

01.01 Identify hand tools.
01.02 Utilize measuring tools.
01.03 Select and use basic shop equipment.
01.04 Operate and maintain welding equipment.
01.05 Operate water testing equipment.

02.0 READ AND SCHEMATIC INTERPRET BLUE PRINTS AND SCHEMATICS — The student will be able to:

02.01 Interpret detail drawings.
02.02 Read symbols.
02.03 List materials for fabrication.
02.04 Develop shop drawings.
02.05 Trace out color coded circuits.
02.06 Prepare pictorial drawings for circuits.
02.07 Prepare exploded views circuits.
02.08 Take demensions off drawings.

03.0 PERFORM BASIC SOLDERING — The student will be able to:

03.01 Employ safe shop practices.
03.02 Identify joints, positions and metal thickness.
03.03 Weld plates in flat position.
03.04 Weld sguare edge bolt, 3/16" plate, filed 3/16", in vertical position.
03.05 Lab weld 3/16" plate in vertical position.
03.06 Fillet weld ¼" plate in vertical position.
03.07 Lap weld ¼" plate in vertical position.
03.08 Butt weld 3/16" plate in horizontal position
03.09 Butt weld ¼" plate in horizontal position.
03.10 Butt weld ¼" plate (top leuel plate) in horizontal position.
03.11 Butt weld 3/16" plate in overhead position.
03.12 Lap weld 3/16" plate in overhead position.
03.13 Butt weld ¼" plate in overhead position.

04.0 MOVE AND SET UP VENDING MACHINES — The student will be able to:

04.01 Apply state vehicle code as applied to automatic vending machines.
04.02 Practice defensive driving.
04.03 Demonstrate knowledge of private property regulations.
04.04 Demonstrate knowledge of company regulations.
04.05 Maintain vehicle of transport.
04.06 Load vehicle to insure product care and product separation.
04.07 Maintain vehicle and product cleanliness.

05.0 LOAD AND OPERATE MACHINES — The student will be able to:

05.01 Load dispensing machines.
05.02 Test operation of machine following loading.

06.0 TROUBLE SHOOT AND REPAIR COIN MECHANISMS — The student will be able to:

06.01 Disconnect and reassemble national rejector.
06.02 Disconnect and reassumble coin acceptor.
06.03 Disassemble and reassemble coin changers.
06.04 Trouble shoot wiring assembly.
06.05 Test changer for operation.
06.06 Apply and maintain steppers and accumulators.

07.0 PERFORM MINOR MAINTENANCE AND REPAIR OF MACHINES — The student will be able to:

07.01 Identify food vending machines by type through age dating.
07.02 Conduct preventative maintenance in food vending machines.
07.03 Identify cup dispensing variances in beverage machines.
07.04 Trouble shoot refregeration devices in beverage machines.
07.05 Evaluate liquid pumping and drawing in beverage dispensing machines
07.06 Identify external/internal assembly of beverage dispensing machine.
07.07 Replace pressurized gas containers.

08.0 DEMONSTRATE APPROPRIATE SANITATION PRACTICES — The student will be able to:

08.01 Demonstrate knowledge of NAMA public health regulations.
08.02 Demonstrate knowledge of NAMA equipment compliance code.
08.03 Demonstrate knowledge of University of Indiana test labs.
08.04 Demonstrate knowledge of role of health department inspectors.
08.05 Demonstrte knowledge of food handling procedures.
08.06 Evaluate food handling and storage based on transportation, temperature and time.
08.07 Conduct daily/weekly sanitation procedures on machines.
08.08 Conduct monthly preventative sanitary procedures on machines.
08.09 Conduct general field sanitation based on machine location, exterior construction and maintenance.
08.10 Evaluate water supply and disposal facilities.
08.11 Conduct inspection of sanitary delivery of product.
08.12 Evaluate shop and commissary sanitation.

09.0 PERFORM BASIC ELECTRICAL/ELECTRONIC REPAIRS — The student will be able to:

09.01 Apply basic electrical safety practices.
09.02 Identify the nature of electricity.
09.03 Apply OHMS law.
09.04 Identify magnetism and electomagnetic induction.
09.05 Identify electrical components symbols and diagrams.
09.06 Apply basic electrical theory and calculations.
09.07 Calculate and measure electrical valves in series and parallel circuits.
09.08 Compare alternating-to direct-current.
09.09 Test electrical components.
09.10 Test single and three phase motors
09.11 Test capcitors and rectifiers
09.12 Test solid state components.
09.13 Design electrical systems.
09.14 Test coils, relays and solenoids.
09.15 Describe electrodes applications.

10.0 PERFORM PIPING AND PLUMBING REPAIRS — The student will be able to:

10.01 Demonstrate basic plumbing skills.
10.02 Braze aluminum tubing.
10.03 Bend copper tubing
10.04 Braze weld copper tubing.
10.05 Cut steel pipe.
10.06 Cut PVC pipe.
10.07 Flare copper tubing.
10.08 Flare copper tubing.
10.09 Braze two metal jobs.
10.10 Assemble specialized fillings.
10.11 Install pipe.
10.12 Secure pipe to various surfaces.
10.13 Install water pipes.
10.14 Pressure test water system.
10.15 Connect machine plumbing to water supply.
10.16 Install drainage for machine as appropriate.

11.0 PERFORM REFRIGERATION SYSTEM REPAIRS — The student will be able to:

11.01 Apply principles of thermodynamics to vending refrigeration.
11.02 Apply HEAT ETHALPY chart BTU/lb.
11.03 Apply principles of latent heat, effective heat, super heat.
11.04 Apply principles of Boyles Law and Charles Law.
11.05 Apply principles in changes in state of matter.
11.06 Apply principles of conduction/convection heat.
11.07 Define function of refrigeration components: compressors, controls evaportors, condensors, accession driers, filters, defrost, by-pass.
11.08 Trouble shoot the system by:
  a.Identifying the problem
  b.Determing proper solution, time, cost, and parts availability
  c.Making repairs
  d.Testing
11.09 Describe construction and function of hermatic compressor.
11.10 Describe construction and function of evaporator post.

11.11 Describe construction and function of condensors—static and depromic.
11.12 Describe construction and function of minor components.
11.13 Test and exchange refrigeration units.

12.0 PERFORM MAJOR MACHINE MAINTENANCE — The student will be able to:

12.01 Repair food vending machines by:
  a. Identifying machine through age dating
  b. Identifying and clearing coin mechanism
  c. Repairing/replacing parts
  d. Checking for preventative maintenance
12.02 Repair beverage vending machine by:
  a. Idenfifying cup dispensing variances in hot and cold machines
  b. Trouble shooting refrigeration devices
  c. Evaluating liquid principles through pumping and draining
  d. Checking external/internal assembly
  e. Checking coin mechanism
  f. Refinishing damaged surface
12.03 Repair recreational machine by:
  a. Assessing nature of problems
  b. Assessing coin mechanism
  c. Repairing/repkacing parts
  d. Finishing metal/wood surfaces
  e. Testing for operation

13.0 REPAIR AND REFINISH METAL — The student will be able to:

13.01 Use primers and sealers.
13.02 Clean surface for refinishing.
13.03 Sand painted surface.
14.04 Strip damaged surface.
15.05 Fill depressed area with fillers.
16.06 Apply corrosion-control materials.
17.07 Select paints as appropriate.
18.08 Apply paint or polish as appropriate.

14.0 MAINTAIN RECORDS AND MEET SANITATION STANDARDS — The student will be able to:

14.01 Maintain service records.
14.02 Complete and file service call records.
14.03 Be familiar with and practice governing health codes
14.04 Comply with state and county health code standards.
14.05 Demonstrate practice of personnel health.
14.06 Use water test equipment.

15.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS — The student will be able to:

15.01 List sources of job openings other than public or private employment agencies.
15.02 Write a letter of application for a job.
15.03 Prepare a vita, resume or personal fact sheet.
15.04 List factors to consider when applying for a job.
15.05 List ways of making contact with employers.
15.06 Identify documents which may be required when applying for a job interview.
15.07 Complete a job application form correctly.
15.08 Identify appropriate dress and grooming for a job interview.
15.09 Classify behaviors considered appropriate or inappropriate in a job interview situation.
15.10 Describe advantage to employer and employees of being a productive worker.
15.11 Explain the purpose of supervision, self discipline and performance evaluation.
15.12 Identify appropriate response(s) to criticism from employer, supervisor or other employees.
15.13 List consequences of being absent frequently from the job.
15.14 List consequences of frequently arriving late for work.
15.15 List factors to consider when resigning from a job.
15.16 Write a letter of resignation.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Watchmaking and Repair

CODE NUMBER: Secondary ______ Postsecondary WIR0100

Florida CIP IN47.040800

SECONDARY SCHOOL CREDITS _____ COLLEGE CREDITS _____ POSTSECONDARY ADULT VOCATIONAL CREDITS _____

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

_____ Postsecondary Vocational x Other 13-17

CERTIFICATION COVERAGE: WATCH REPR @ 7 INSTRMENT 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as watch repairers, assemblers, chronometer assemblers and adjusters, final inspectors, hairspring truers, watch assemblers, watch parts inspectors, or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, manufacturing, maintaining, and repairing clocks, watches, chronometers and other time measuring devices by diagnosing malfunctions, disassembling, repairing, and/or replacing faulty parts; cleaning, assembling, and adjusting parts, and replacing straps, bands, crystals, crown, and hands.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in the use of bench and hand tools including lathes, staking tools, loupes, truing calipers, timing machines, pallet warmers and other grinding, drilling, and polishing tools. Experience in the use of various materials as metals, plastics, chemicals, oils, waxes and abrasives is included.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 2160 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate understanding of procedures and operation of timepieces.
02. Select, use, and maintain watchmaker tools and equipment.
03. Repair mechanical timepieces.
04. Repair power units.
05. Maintain and repair the train of wheels.
06. Maintain and repair jewelled lever escapements.
07. Replace, true, and poise balance wheels.
08. Repair dial trains.

09. Repair electronic timepieces.
10. Repair clocks.
11. Time and adjust timepieces.
12. Demonstrate sales and shop management skills.
13. Demonstrate employability skills.
14. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial Education SECONDARY NUMBER: ________

PROGRAM TITLE: Watchmaking and Repair POSTSECONDARY NUMBER: WIR0100

01.0 DEMONSTRATE UNDERSTANDING OF PROCEDURES AND OPERATION OF TIMEPIECES--The student will be able to:

01.01 Identify the basic types of timepieces.
01.02 Identify an describe the parts of a watch and chiming clock.

02.0 SELECT, USE, AND MAINTAIN WATCHMAKER TOOLS AND EQUIPMENT--The student will be able to:

02.01 Demonstrate the knowledge of filing and files by filing three types of gravers.
02.02 Show techniques and care in the use of timepiece repair bench tools and equipment.
02.03 Exhibit the ability to turn a balance staff to specifications on the watchmakers lathe, using proper work and safety precautions.

03.0 REPAIR MECHANICAL TIMEPIECES--The student will be able to:

03.01 Demonstrate the sequence, inspection, and safety precautions of a watch being disassembled; repairing component parts; machine cleaning of a disassembled watch movement and describing theory and nomenclature of watch movement.
03.02 Show techniques of sequence, inspection, and safety precautions of assembling the time train of a watch movement.
03.03 Assemble in proper sequence, showing methods of inspection and safety precaustions, the dial train of a watch movement.

04.0 REPAIR POWER UNITS--The student will be able to:

04.01 Identify the various ends of watch mainsprings, and to demonstrate the ability to replace the correct size and type mainspring for a specific watch barrel.
04.02 Identify the various ends of a clock mainspring and to demonstrate the ability to replace the correct size and type mainstrings for a specific clock.
04.03 Demonstrate the methods and techniques of replacing and repairing maingsprings ends; and the techniques of procedure used in the repairing of barrel teeth and covers.

05.0 MAINTAIN AND REPAIR THE TRAIN OF WHEELS--The student will be able to:

05.01 Describe the history, function, and nomenclature of train wheels, demonstrate the theory of the ratio of reduction power, and show the methods and procedure of repivoting and replacement of teeth in wheels.
05.02 Describe the functions, types, sizes, and materials used in timepiece jewels and demonstrate the techniques of jewel replacement.

06.0 MAINTAIN AND REPAIR JEWELLED LEVER ESCAPEMENTS--The student will be able to:

06.01 Describe the history, function, and nomenclature of a watch lever escapement and demonstrate the ability to repair a broken section of an abused watch escapement.
06.02 Demonstrate the ability to adjust a watch escapement.

07.0 REPLACE, TRUE AND POISE BALANCE WHEELS--The student will be able to:

07.01 Demonstrate the sequences and techniques of replacing friction and rivet type balance staff in a watch balance wheel, using proper safety precautions.
07.02 Exhibit the ability to true a balance wheel in both round and flat and be able to demonstrate the methods of poising a balance wheel by removing or adding weight.

08.0 REPAIR DIAL TRAINS--The student will be able to:

08.01 Describe the functions, nomenslature, and theory of the operations of the dial train and demonstrate the techniques of repairing and adjusting the dial train.
08.02 Describe the function, operation and nomenclature of both the positive and negative watch setting mechanism and demonstrate the techniques of repairing the watch setting mechanism.
08.03 Explain the function, nomenclature, and theory of operation of the watch winding mechanism and demonstrate the methods of repairing the watch winding mechanism, using proper work and safety precautions.

09.0 REPAIR ELECTRONIC TIMEPIECES--The student will be able to:

09.01 Describe the function, operation, theory, and nomenclature of a VOM meter, using proper work and safety precautions.
09.02 Describe the function, operation, theory, and nomenclature when replacing electronic modules in a timepiece, using proper work and safety precautions.
09.03 Describe the functions, theory, operations, and nomenclature and demonstrate the techniques of repairing an electronic balance wheel timepiece, using proper work and safety precautions.
09.04 Describe the functions, theory, operations, nomenclature and demonstrate the techniques of repairing an electronic tuning fork timepiece, using proper work and safety precautions.
09.05 Describe the function, theory, operation, and nomenclature and demonstrate the techniques of repairing an electronic quartz crystal timepiece.

10.0 REPAIR CLOCKS--The student will be able to:

10.01 Demonstrate the sequence, inspection, and safety precautions of a clock time train being disassembled - repairing component parts and machine and hand cleaning of the clock disassembled time train, and describe the theory and nomenclature of the clock time train.
10.02 Describe the history, function, and nomenclature of the clock strick train and demonstrate the ability to repair and synchronize the clock strike train, using proper work and safety precautions.
10.03 Describe the history, function, and nomenclature of a clock chime train and demonstrate the ability to proper work and safety precautions.
10.04 Describe the function, history, operations, and nomenclature of a clock pendulum escapement and demonstrate the ability to repair and adjust a clock pendulum escapement.

11.0 TIME AND ADJUST TIMEPIECES--The student will be able to:

11.01 Diagnose the escapement errors and precisely regulate and adjust the timing for both positional and isochronal errors of a mechanical timepiece, with the use of a tape timer, micro product computer, and a beatmeter.
11.02 Precisely regulate an electronic timepiece with the use of a tape timer, a micro products computer and beatmeter.
11.03 Diagnose the escapement errors and precisely regulate and adjust the beat and timing of a pendulum clock, with the use of a micro products computer and beatmeter.

12.0 DEMONSTRATE SALES AND SHOP MANAGEMENT SKILLS--The student will be able to:

12.01 Demonstrate sales ability by showing how to handle customers.
12.02 Identify the State Board Watchmaker Regulations and requirements and to show and explain the purpose of State Public Identification Plan.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

13.01 Conduct a job search.
13.02 Secure information about a job.
13.03 Identify documents which may be required when applying for a job interview.
13.04 Complete a job application form correctly.
13.05 Demonstrate competence in job interview techniques.
13.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.

13.07 Identify acceptable work habits.
13.08 Demonstrate knowledge of how to make job changes appropriately.
13.09 Demonstrate acceptable employee health habits.

14.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

14.01 Define entrepreneurship.
14.02 Describe the importance of entrepreneurship to the American economy.
14.03 List the advantages and disadvantages of business ownership.
14.04 Identify the risks involved in ownership of a business.
14.05 Identify the necessary personal characteristics of a successful entrepreneur.
14.06 Identify the business skills needed to operate a small business efficiently and effectively.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Welding

CODE NUMBER: Secondary ______ Postsecondary MTR0100

Florida CIP IN48.050800

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-17

CERTIFICATION COVERAGE: WELDING 7 METALLURGY @ 7 METAL WORK @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as welders and flame cutters (61022002), tack welders (810.684-010), welder assemblers (819.381-010), arc cutters (816.364-010), arc welders (810.384-014), combination welders (819.384-010), production line welders (819.684-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, use of blueprints and shop drawing, use gases and/or welding processes and braze parts according to diagrams, blueprints or written specifications.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in various processes and techniques of welding and fabrication skills, including oxyacetylene welding and cutting (OAW), brazing, arc welding (SMAW), MIG welding (GMAW), TIG welding (GTAW), certification test preparation, and use of current industry standards, practices, and techniques.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1600 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Read blueprints.
02. Identify metals.
03. Apply basic shop skills.
04. Apply gas welding skills.

05. Apply shielded metal arc welding skills (SMAW).
06. Apply shielded gas welding skills (GTAW), (GMAW), (FCAW).
07. Apply plasma arc skills.
08. Fabricate and weld pipe.
09. Perform combination welding skills.
10. Demonstrate employability skills.
11. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS　　EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial　　SECONDARY NUMBER: ________

PROGRAM TITLE: Welding　　POSTSECONDARY NUMBER: MTR0100

01.0 READ BLUEPRINTS--The student will be able to:

01.01 Interpret detail drawings.
01.02 List materials for fabrication from blueprint.
01.03 Develop shop drawings.

02.0 IDENTIFY METALS--The student will be able to:

02.01 Identify metals by appearance and weight.
02.02 Identify materials by spark test.
02.03 Classify metals by magnetic properties.

03.0 APPLY BASIC SHOP SKILLS--The student will be able to:

03.01 Apply communications and leadership skills.
03.02 Apply safety practices.
03.03 Apply measuring skills.
03.04 Apply cutting skills.
03.05 Apply bending skills.
03.06 Apply drilling skills.
03.07 Apply punching skills.
03.08 Apply finishing skills.

04.0 APPLY GAS WELDING SKILLS--The student will be able to:

04.01 Set up oxy-fuel equipment.
04.02 Cut carbon steel using oxy-fuel equipment.
04.03 Run beads with gas welding equipment.
04.04 Gas weld carbon steel joints.
04.05 Gas weld cast iron.
04.06 Braze ferrous and non ferrous metals.
04.07 Silver braze copper pipe joints.
04.08 Lead solder ferrous and non ferrous metals.
04.09 Form metals with gas equipment.
04.10 Remove distortion using gas equipment.

05.0 APPLY SHIELDED METAL ARC WELDING SKILLS (SMAW)--The student will be able to:

05.01 Run beads with SMAW equipment.
05.02 Apply surfacing skills.
05.03 Weld single pass and multiple pass lap joints.
05.04 Weld outside corner joints.
05.05 Weld multiple pass "tee" joints in all positions.
05.06 Weld butt joints.
05.07 Weld with low-hydrogen electrodes.
05.08 Weld guided bend test plates.
05.09 Cut with SMAW equipment.

06.0 APPLY SHIELDED GAS ARC WELDING SKILLS (GTAW), (GMAW), AND (FCAW)--The student will be able to:

06.01 Assemble GTAW equipment (TIG).
06.02 Run beads with GTAW equipment.
06.03 Weld aluminum joints with GTAW equipment.
06.04 Weld mild steel joints with GTAW equipment.
06.05 Weld stainless steel joints with GTAW equipment.
06.06 Run beads with GMAW equipment (MIG).
06.07 Weld mild steel joints with GMAW equipment.
06.08 Weld mild steel joints with GMAW equipment.
06.09 Weld stainless steel joints with GMAW equipment.
06.10 Weld with flux core equipment (FCAW).

07.0 APPLY PLASMA ARC SKILLS--The student will be able to:

07.01 Assemble plasma arc equipment.
07.02 Cut with plasma arc equipment.
07.03 Weld with plasma arc equipment.

CURRICULUM FRAMEWORK — PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION — EFFECTIVE DATE: July, 1987

PROGRAM TITLE: Welding Technology

CODE NUMBER: Secondary ______ Postsecondary MTR0150

Florida CIP 1N15.061000

SECONDARY SCHOOL CREDITS ______ COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational x Other 13-15

CERTIFICATION COVERAGE: WELDING 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as welding technicians (011.261-014), metallurglical technicians (011.261-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and performance and inspection of a wide variety of welding processes including gas welding, brazing, flame cutting, metallic ore welding, gas welding of ferrous and non ferrous materials, resistance welding, and fusing of glass and plastics in a welding mode.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program and provide instruction in applied physics, metallargy, and chemistry of welding processes, equipment used to accomplish the processes, design for metal fabrication, testing methods, and the use of jigs, fixtures, and annealing equipment related to welding.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is an appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. When provided, these activities are considered an integral part of this instructional program.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 7.0, Language 7.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Read blueprints.
02. Identify metals.
03. Apply basic shop skills.
04. Apply gas welding skills.
05. Apply shielded metal arc welding skills (SMAW).
06. Apply shielded gas welding skills (GTAW), (GMAW), (FCAW).
07. Apply plasma arc skills.
08. Fabricate and weld pipe.
09. Perform combination welding skills.
10. Demonstrate employability skills.
11. Demonstrate an understanding of entrepreneurship.

08.0 FABRICATE AND WELD PIPE JOINTS--The student will be able to:

08.01 Prepare pipe joints for welding.
08.02 Set up and weld pipe joints.

09.0 PERFORM COMBINATION WELDING SKILLS--The student will be able to:

09.01 Repair products of ferrous and nonferrous metals.
09.02 Fabricate products of ferrous and nonferrous metals.

10.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

10.01 Conduct a job search.
10.02 Secure information about a job.
10.03 Identify documents which may be required when applying for a job interview.
10.04 Complete a job application form correctly.
10.05 Demonstrate competence in job interview techniques.
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
10.07 Identify acceptable work habits.
10.08 Demonstrate knowledge of how to make job changes appropriately.
10.09 Demonstrate acceptable employee health habits.

11.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

11.01 Define entrepreneurship.
11.02 Describe the importance of entrepreneurship to the American economy.
11.03 List the advantages and disadvantages of business ownership.
11.04 Identify the risks involved in ownership of a business.
11.05 Identify the necessary personal characteristics of a successful entrepreneur.
11.06 Identify the business skills needed to operate a small business efficiently and effectively.

08.0 FABRICATE AND WELD PIPE JOINTS--The student will be able to:

08.01 Prepare pipe joints for welding.
08.02 Set up and weld pipe joints.

09.0 PERFORM COMBINATION WELDING SKILLS--The student will be able to:

09.01 Repair products of ferrous and nonferrous metals.
09.02 Fabricate products of ferrous and nonferrous metals.

10.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

10.01 Conduct a job search.
10.02 Secure information about a job.
10.03 Identify documents which may be required when applying for a job interview.
10.04 Complete a job application form correctly.
10.05 Demonstrate competence in job interview techniques.
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
10.07 Identify acceptable work habits.
10.08 Demonstrate knowledge of how to make job changes appropriately.
10.09 Demonstrate acceptable employee health habits.

11.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

11.01 Define entrepreneurship.
11.02 Describe the importance of entrepreneurship to the American economy.
11.03 List the advantages and disadvantages of business ownership.
11.04 Identify the risks involved in ownership of a business.
11.05 Identify the necessary personal characteristics of a successful entrepreneur.
11.06 Identify the business skills needed to operate a small business efficiently and effectively.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1987

PROGRAM AREA: Industrial
SECONDARY NUMBER: ________

PROGRAM TITLE: Welding Technology
POSTSECONDARY NUMBER: MTR0150

01.0 READ BLUEPRINTS--The student will be able to:

01.01 Interpret detail drawings.
01.02 List materials for fabrication from blueprint.
01.03 Develop shop drawings.

02.0 IDENTIFY METALS--The student will be able to:

02.01 Identify metals by appearance and weight.
02.02 Identify materials by spark test.
02.03 Classify metals by magnetic properties.

03.0 APPLY BASIC SHOP SKILLS--The student will be able to:

03.01 Apply communications and leadership skills.
03.02 Apply safety practices.
03.03 Apply measuring skills.
03.04 Apply cutting skills.
03.05 Apply bending skills.
03.06 Apply drilling skills.
03.07 Apply punching skills.
03.08 Apply finishing skills.

04.0 APPLY GAS WELDING SKILLS--The student will be able to:

04.01 Set up oxy-fuel equipment.
04.02 Cut carbon steel using oxy-fuel equipment.
04.03 Run beads with gas welding equipment.
04.04 Gas weld carbon steel joints.
04.05 Gas weld cast iron.
04.06 Braze ferrous and non ferrous metals.
04.07 Silver braze copper pipe joints.
04.08 Lead solder ferrous and non ferrous metals.
04.09 Form metals with gas equipment.
04.10 Remove distortion using gas equipment.

05.0 APPLY SHIELDED METAL ARC WELDING SKILLS (SMAW)--The student will be able to:

05.01 Run beads with SMAW equipment.
05.02 Apply surfacing skills.
05.03 Weld single pass and multiple pass lap joints.
05.04 Weld outside corner joints.
05.05 Weld multiple pass "tee" joints in all positions.
05.06 Weld butt joints.
05.07 Weld with low-hydrogen electrodes.
05.08 Weld guided bend test plates.
05.09 Cut with SMAW equipment.

06.0 APPLY SHIELDED GAS ARC WELDING SKILLS (GTAW), (GMAW), AND (FCAW)--The student will be able to:

06.01 Assemble GTAW equipment (TIG).
06.02 Run beads with GTAW equipment.
06.03 Weld aluminum joints with GTAW equipment.
06.04 Weld mild steel joints with GTAW equipment.
06.05 Weld stainless steel joints with GTAW equipment.
06.06 Run beads with GMAW equipment (MIG).
06.07 Weld mild steel joints with GMAW equipment.
06.08 Weld mild steel joints with GMAW equipment.
06.09 Weld stainless steel joints with GMAW equipment.
06.10 Weld with flux core equipment (FCAW).

07.0 APPLY PLASMA ARC SKILLS--The student will be able to:

07.01 Assemble plasma arc equipment.
07.02 Cut with plasma arc equipment.
07.03 Weld with plasma arc equipment.